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EDITORIAL NOTES—GAS, &c.

Gaslight and Coke Company—Unaccounted-for Gas.

THE spirit of contentment appears to have settled over the proprietary of the Gaslight and Coke Company with extraordinary rapidity; and it was noticeably marked at the meeting on Friday. It was a thinly attended meeting; and there was little more than the eloquent testimony of absence and silence to express the gratitude of the proprietors for the success of the strenuous work that the Board, officers, and staff generally have accomplished to set the affairs of the Company on a firmer base, from which a more profitable result than hitherto can be realized. But the proprietors, in their contentment, must not forget that it is easier to follow a degenerating course than it is to maintain, under generous and adverse circumstances alike, those results that represent high efficiency; and that, while those who conduct their affairs, whether from the Board room or executively, have done so much in rehabilitation, energy must needs be constantly tense to prevent back-sliding, and to add to accomplished result further, and more difficultly attained, improvement. We point this out because, in the contentment with changed circumstances, it may be forgotten. Neither the Board nor the officials desire fulsome praise—it would be objectionable to them; but let the proprietors not nurse any mistaken belief that improved conditions represent any lessening of responsibility, anxiety, and labour.

The financial tale the Governor (Mr. Corbet Woodall) had to tell was almost monotonous in its unbroken line of good point. As was shown last week in these columns, the heavy extra bill for coal has been discharged, depreciation has been well provided for, the insurance fund has had a substantial credit supplement from the half-year's profits, the difference in the reduction of 1d. in the price of gas and the revenue from the reinstatement of meter-rents has been met, and the profits allow of the increase of dividend, and of an additional carry-over. That is in a nutshell the financial position as a result of the half-year's trading; and, after what was said last week, there is no occasion to more particularly retrace our steps over the financial ground. The position in the event is altogether better than the Governor anticipated; and proprietors are satisfied. There were only two causes of disappointment on which the Governor could place his finger. One of these causes it is hoped will prove itself amenable to allaying treatment; and the other it is believed will, in a measure, provide its own cure by inherent good quality. Let us refer to the latter point first. There was a decrease of ½ per cent. in the quantity of gas sold in the half year compared with the corresponding period of 1907. Climatic conditions were partly responsible for this; and that part is subject to variation, in great or less degree, from half year to half year. The other part is undoubtedly due to the advancing efficiency year by year of gas appliances, and the increasing application of the fresh improvement. The effect is appreciable; and very much so in a district such as that of the Gaslight Company, where business is done on large scale. Not a small part of the consumers of the Company, through the extent of their needs, run up very big accounts; and when individual accounts, through changing from the ways in gas illumination that were to the ways that are, exhibit savings of 2 to 3 million cubic feet, it demonstrates, with an almost uncouth splendour, what modern invention has done for gas and its patrons. But the improved value thus given, must in time have a compensating action by encouraging a greater use of that which is so economical. There is another aspect of the gas part of the Company's business on which one might dwell. With their immense volume of business, the Company cannot now expect to show large ascents in consumption as expressed in percentages; as 1 per cent. represents with them an enormous volume of gas. When 1 or 2 per cent. increases in future are obtained, they must be accepted as representing good business; and such increases will have to be industriously worked for. The district of the Company does not offer great scope for continuously realizing notable expansion figures; for, at a rough guess, probably 90 per cent. of it is now covered with property. Thus, in a large portion of the area, business can only be developed from existing conditions, without the effective aid of new fields that are opened from time to time where localities are not sealed against building development.

Associated with this question of the make, sale, and distribution of gas, the Governor points to a problem that is as mysterious as it is tantalizing. But the solution has to be wormed-out somehow by the technical staff. The unaccounted-for gas has gone up by 1 per cent.; and the millions of cubic feet that this 1 per cent. alone represents would more than meet a year's gas requirements of many a town. The district of the Company is a unique one; there is nothing comparable with it in the whole of the country, either on the surface of the roadways or beneath them. And this being so, it would not be surprising if their unaccounted-for gas stood the highest in the kingdom. There is no distribution so vast, no distribution system that has of late years been subject to so much disturbance through underground and surface work, there is no distribution system that of late years has had so much heavy and fast moving traffic brought upon it from—to its full extent—east to west and north to south. There must be parts of it subject to continuous vibration from traffic above and below. When the older parts of the distribution system were laid, it was never contemplated that London would be what it is to-day. But with it all, the percentage of unaccounted-for gas has not hitherto been relatively excessive. There is, however, this large volume increase in a twelvemonth—making the unaccounted-for gas nearly 7½ per cent. of the total output. The problem is, Why is there this considerable and abnormal difference in so short a period? It seems something more than an incremental effect of the strain of modern circumstances. If that were the only cause, then the increase is serious indeed, and may be expected to be progressive. Yet, looking at the matter critically, what else is there to account for it? It is true, pressures have been somewhat increased, and there is a considerable use of the pilot-light, which may not always be properly accounted for in the registration of the meters. But these conditions were existent before the large addition to the unaccounted-for gas of the past twelve months. They may, therefore, perhaps be dismissed from the consideration of the year's increase, and the cause or causes be sought elsewhere; and that "elsewhere" seems to be in those conditions that are peculiar to this Company's district compared with the normal conditions of other gas companies' areas. We call to mind, in this connection, the grave statement made by the Governor at the February meeting in 1906, when, quoting from a report of the Distributing Engineer (Mr. G. F. L. Foulger), he stated that while in 1899, in certain leading thoroughfares of the Company's district, there were 87 cases of broken mains and drawn joints, in 1905 there were in the same thoroughfares as many as 687. However, from engineering and other points of view, the explanation as to last year's large increase, if one is forthcoming after further inquiry, will be interesting.

Among other general points, the Governor dwelt upon the educational facilities the Company provide for their employees, the new scheme for training lads in the fittings department with theoretical educational accompaniment by the London County Council; and the provision of savings bank facilities for the men. Parliamentary measures—the Coal Mines (Eight Hours) Bill and the Port of London Bill, both of which are noticed in another article—received consideration. Now what of the future? Coal and oil will be lower in price; but there seems to be some reticence in voluntarily giving average figures showing what the reductions will really represent, though they are pretty generally known. But against this easing of expenditure in these directions, it is hardly probable that the prices of residuals will be maintained at recent levels. However, the most

important feature of the whole meeting was the statement from the chair that, it is expected that, before the proprietors meet again, a further penny reduction in the price of gas will be announced. If this good intention fortunately matures, the concession of 2d. that will then have been made to the consumers, will represent to them about £160,000 a year; while the advantage to the proprietors will be covered, to give a round sum, by about £40,000 a year. On a better point, this comment on the proceedings at the meeting could not end. But we cannot help asking again, Do the proprietors sufficiently recognize what this change of condition all means in the case of the Gaslight and Coke Company?

Co-Partnership at Tottenham.

THE flourishing condition of the Tottenham and Edmonton Gas Company's business, the intimation that there is likely to be an early further reduction in the price of gas, and the foreshadowing of the next extension of the carbonizing plant being on the vertical retort system, all sink in interest beside the announcement which it is our pleasure to make to-day, that the proprietors of the Company, at their meeting on Saturday, after an explanatory statement by the Chairman (Mr. Corbet Woodall), agreed to take into partnership their employees, and so afford them opportunities for improving their position in life, which improvement, without a friendly helping hand, the most honest and struggling of them find it difficult, in some cases impossible, to effect under the modern competitive and onerous conditions of life. We talk airily of men being paid the market value of their labour. That market value is fixed partly and artificially by the instrumentality of the Trade Unions, but largely by the law of supply and demand. But that law pays no heed to the pressure that is brought upon the resources of the hard-working and thrifty workman in maintaining a decent level of existence, and which pressure is ever waging war with him in his endeavours, in the days of his strength, to make his position secure when strength fails him. It may be argued—we will meet the point—that many workmen by giving way to the passions, vices, and temptations that are spread around, worsen their own conditions. We concur. They are those who sink below the level of the respectability which absorbs in its maintenance the current wage. They are not the only—but are the most despised, though the most to be pitied—weaklings of humanity; and the students of sociology will tell us that their sinking is due, in no small degree, to the conditions and pressure of lot and surroundings. They show pusillanimity. Agreed; and because of that they require what their more respectable fellows deserve—the helping hand.

Here we have in the Tottenham and Edmonton Gas Company an undertaking that has enjoyed most remarkable prosperity; and its prosperity has greatly extended employment. In the prosperity, the consumers have had their share; and so have the proprietors. But what of the workmen? A larger number have had security of employment, and good employment; but they have soon arrived at the dead-wall of individual advantage. Beyond that —— well there has been no beyond for them; that has practically all been reserved for the consumers and the proprietors. However, in Mr. Woodall and his colleagues of the Board and the chief officials of the Company—Mr. A. E. Broadberry and Mr. E. Topley—there are new adherents to the cause of co-partnership; and the proprietors have followed them without a dissentient voice. The workmen have a new outlook opened to them that could never have been opened by anyone but those who give them their daily employment. They have now offered to them a means for bettering their position in life, and for making provision for the future; and, as they realize the beginning of changed circumstance, those influences will commence and operate that lead, in both work and home life, to the victory of the moral law. The effect has been witnessed elsewhere; and we cannot deny the witness of the existing.

The Tottenham men—no one can fail to recognize the fact—hold in their hands a tremendous responsibility in making the scheme a success, far beyond the narrow boundary lines of their own personal benefit; and we appeal to them strongly and earnestly to determine to stand shoulder to shoulder to prove to the Chairman of the Company that the taking of the workers into partnership effects all that has been represented by the pioneer of the system in the gas industry and his followers. No one can tell to what great things success at Tottenham will lead. There is no one Sir George Livesey could name whom he could welcome more heartily as a co-worker for this cause than Mr. Woodall, for reasons that are too plain to ask of us special reference. No one, however, can accuse Mr. Woodall of having hitherto been out of sympathetic joint with the workmen of the many Companies with whom he has been, and is, identified. His whole professional and administrative history stands as a contradiction. But Saturday's meeting at Tottenham gives us the first public declaration of his personal adoption of—conversion to, would be too strong an expression—the cause of co-partnership, the cause that has for its starting-point "the greatest good for the greatest number." He and his colleagues at Tottenham are wise in their choice of time. The long reign of peace in the gas industry, the absence of any sign of agitation, absolves them of any motive other than the good of the men, and of the interests of the undertaking. But as men of affairs, as men who are not blind to external movements, they also prefer to voluntarily concede the conditions that will ensure perpetual contentment.

The details of the scheme that the Directors are offering, with the full approbation of the proprietors, are sketched in the Chairman's address at the meeting. Those who are interested will look for these details in the report. Mr. Woodall, however, called the scheme a "profit-sharing" one. It is something more; and it comes well under the more dignified and expressive title of "Co-Partnership." The scheme does not go so far as the system of the South Metropolitan and South Suburban Companies, in that it does not take in the top stone supplied by the workman-director. We like the idea of the workman-director; but the workman-director is not a *sine quâ non* to co-partnership, although it rounds it off. Therefore, let us have co-partnership without the workman-director rather than no co-partnership at all. And the scheme of the Tottenham and Edmonton Company is co-partnership pure and simple, and not merely profit-sharing. The workers share in the profits; but the scheme ensures inclusion in the proprietary. The worker will take his part of the profit; he also, by the investment of that profit, will become a holder of stock; and he will, therefore, with equal rights to the ordinary proprietor, take his dividend on the investment. He will be a partner, and nothing short of one; and not a mere sharer in profits, as distinct from dividends. It is to each man's interest to work for an increase of dividend and bonus with which to build up his holding in the Company; and he can only do so by working simultaneously for a reduction of the price of gas. Such a partnership is a very real one; and in it the ordinary proprietor and the gas consumer can see that they take into partnership very active workers, and not lethargic capital holders, to their own advantage. Let us stick to the title for the scheme that is the most appropriate, and that expresses in the best possible manner the common unity of interest. But, to end on a higher aspect of this question, we know of no scheme that employers of gas undertakings can adopt for the improvement of their employees in mind, body, and estate than that which to-day is so honourably identified and known as "Co-Partnership."

Public Measures.

PARLIAMENT has ceased for a short period the prosecution of its epoch-marking legislative programme; and no one will be sorry for the brief respite. The heavy programme undertaken this session necessitates an autumn sitting; and with its aid—involving the whole of the weeks from Oct. 12 to close upon Christmas—there is agreement among the prophets as to the impossibility, by the application of all human energy, of completing the defined task. Looking at the finished and the unfinished parts of the programme, it is seen how largely industry is engulfed in the profundity of the schemes of the Government; and it must at once cross the mind of thinkers that a policy is inherently wrong that is directed to the weakening of the main principals in the country's stability and scattering the proceeds. In the whole of the schemes fortunately the gas industry, as such, has no especial concern; but it finds itself intimately attached to those that affect labour, the cost of materials, and the maintaining of a high level of taxation. The three public measures of first importance to the gas industry this session are the Old Age Pensions Bill, the Coal Mines (Eight Hours) Bill, and the Port of London Bill.

The Old Age Pensions Bill has received the Royal Assent; and it now stands, for good or ill, as part of the law of the land. The Coal Mines (Eight Hours) Bill is still under discussion;

and its progress is therefore deferred to the autumn session. It has passed the second reading in the House of Commons; and is now before one of the Standing Committees. It is difficult to know to-day exactly how the Government regards this measure; but there have been interpretations of what have been, rightly or wrongly, accepted as omens that the Government are not so strong now in their feelings as to the righteousness and harmlessness of the measure as their professions at one time represented. That they have been stirred, though slightly, by the protests of industry, is manifested by the extension of the working day in mines to eight-and-a-half hours for five years, after which time the eight-hour day is to be the duration of employment from bank to bank. The eight-hour day is the objective; and, as if to insist upon there being no possible mistake about it, Mr. Herbert Samuel, the Under-Secretary of the Home Office, said, before the adjournment of the Committee, that the Government wanted to make the measure an Eight Hours Day Bill in reality. Before, however, the Committee commenced their sittings, the Prime Minister intimated that the fate of the Bill was dependent upon the amount of progress made by the Committee before the August adjournment. The progress of the Committee was not great; clause 1 still being under discussion at the time of the adjournment to Oct. 15. It was patent during the proceedings as far as they have advanced that the Opposition are proposing to deal with the measure in an exhaustive manner, if Mr. Gladstone does not too frequently move the closure, and succeed in getting it applied. That is the position; and nothing more can be said upon it at present, other than to point out that the reason advanced by the Government for taking up the measure was shown by Sir George Livesey, at the meeting of the South Suburban Gas Company last Friday, to be about the most ridiculous they could possibly have chosen.

Regarding other measures. The Joint Committee of the Lords and Commons who have been considering the Port of London Bill have reported that it ought to be allowed to proceed. It will be remembered that the Gas Companies interested in the River Thames as being the most economical route for their raw materials and other goods appeared before the Committee, not with the idle intention of opposing the main principles of the measure, but to assure, as far as was possible, the best consideration being given to the interests of the public services conducted by them under parliamentary direction and control. They were unsuccessful at this stage in securing for their undertakings any solid advantages; but it is to be hoped that what they have done has shown that the volume of the traffic for which they are responsible on the Thames deserves proper representation on the new Port Authority, and will command an adequate consideration of their submissions in respect of the dues they will hereafter be called upon to pay. Their position is altogether different from that of ordinary ship and barge owners using the river. The character of their business —being statutorily regulated, and public services in restricted districts—demands special attention in determining the dues to be enforced. On this point, the Companies will yet have an opportunity of being heard, as, when the Port Authority have drawn up the schedule of dues, it has to go for approval before the Board of Trade, who will be prepared to hear objectors, and then the schedule will be incorporated in a Provisional Order, and be presented to Parliament for confirmation. An opportunity will then again be presented for opposition, if satisfaction has not already been attained. In the original programme of the Government for the session, there was another Bill promised, to which all administrators of gas undertakings labouring under the heavy burdens of taxation and rating, must have looked forward in the hope of its proving a way of relief, and a means of readjusting the basis of taxation and rating for their special class of property. It is a vast and much entangled subject with which it is intended the proposed Bill shall deal and amend in principle and rule—involving, too, both imperial and local charges. But the hands of the Government are full; and the Valuation of Property Bill is not at present even in rough-cast form. It cannot therefore be expected that the measure will be introduced in the autumn session, though the Government have not yet voluntarily and specifically jettisoned it.

Among the measures that have already received the Royal Assent are the Old-Age Pensions Bill, the Companies' Consolidation Bill, and the Patents and Designs Bill; and these now form part of the law of the land. The two latter do not call for notice here; but the Old-Age Pensions Bill in its latter stages raised certain questions, one of which shows a grave defect in our legislative system by the disability of the Upper House to effectually insist on revising a Bill of this kind which is not purely a financial measure, but introduces something new and untried by us into our social system and alters the social relationships by, *bon gré mal gré*, compulsorily compelling contribution to the support of the aged. All the useful amendments of the Bill suggested by the Upper House were, whether or not they had merit, rejected with an iron hand by the Lower House on the ground that they violated the unwritten but prescriptive privileges of their House. It is, we say, a grave defect in our methods of constructive legislation, that one of the Chambers (the work of which is controlled by an enormous majority at the back of the Government) should be allowed, in such an instance as this, to assume the possession of an infinite wisdom, incapable of erring and unassailable by the Second Chamber, and that the latter should be limited in their movements to the simple option of pronouncing a blessing or rejecting completely what they in their heart of hearts fully believe in, though the method of attaining it needs improvement.

The matter does not call for further discussion here; but the extraordinary interpretation of the doctrine of privilege that has been given in connection with this particular measure cannot be ignored altogether in any notice of legislation or parliamentary procedure affecting industry. Nor is there any necessity to treat of the amendments that were submitted by the Lords. The principle of Old Age Pensions has long been accepted by Parliament and the country; the only questions over which there could be issue, with a view to future supplementary or modifying legislation, are those of method and extension. But there is the Act; and we have to accept it with all its deformities. It is a purely Socialistic Act; it embodies an incipient scheme that is capable of untold expansion, and that will bring upon the country unknown responsibilities. It does not define the sources of monetary provision; but in its provision industry will be heavily hit, as the Chancellor of the Exchequer has pointed to the maintenance of the income-tax at a high level as the best, safest, and fairest source of revenue for the purpose. All are—this is an effect of the method adopted—to escape contribution to that provision who are going to be the beneficiaries; the majority of those who are to be compelled to make the provision are those who will be shut out from all advantage, and many are not now better off than numbers of those who will hereafter participate in the pensions. According to the measure of thrift and self-help through working years, so the degree of pension or absolute disqualification. Through the scheme being non-contributory, the practice of thrift will be checked; and old-established friendly societies will be injured. Any reduction of the age limit hereafter will only accentuate these evils of the ill-considered measure. Private pension funds, co-operative schemes between employers and workers, will all be hard-hit by the source of revenue for the scheme being centred principally in industry and in the earner of income through personal skill and labour. It is feared that the rifts that are seen so frequently between employees and employers will through the Act be widened. The private provision of pension and other funds for employees has formed a tie between them and employers, and a means of more frequent communication; but the compulsory contribution of funds, in addition, for State old-age pensions will, we fear, contribute to the severing of that tie, to the closing of one of the channels of communication, and to a further alienation of sympathies. All employers cannot be expected to make a double contribution for the same purpose; their financial position will not admit of it. Lest readers should mistake the attitude adopted here, let it be repeated that we are not directly opposed to State old-age pensions; but the scheme now incorporated in the statute book does appear to be both faulty in its constitution and, in certain of its possible effects, powerful for harm.

Forced Municipalization—Electricity and Coalite.

The present Government are very resourceful. In dealing with the problem of the electricity supply of London, they have failed to drive the London County Council and the ratepayers into a huge and costly speculation in municipalization; so now they are giving support to the Bills of the London and District Electricity Supply Company (the power and bulk scheme) and the existing companies who are jointly in Parliament this year. But the support is accompanied by an instruction to the Committee who will consider the Bills

as they have come down from the Lords, to insert a clause to make it compulsory—not optional—on the part of the London County Council to purchase the new and existing concerns in 1931, and so bring the whole of the electricity supply of the Metropolis under one central authority at that date. That is the idea. The details of its execution are matters for the morrow. It is a fantastic proposal that the successors of the present County Council should have such a command, duty, and responsibility, without the right of a yea or nay on their own part, thrust upon them by a Parliament sitting twenty-three years before the event. No one knows yet what measure of success the power and bulk scheme will achieve; no one knows what will be the position of electrical affairs generally in 1931. But no matter. The Radical Parliament of to-day, with its Progressive and Socialist wings, says that, whatever happens, the electricity supply of London is to come under the County Council, whether or not they like it, in 1931. There is to be no option, no backing out, unless the County Council of the time or before can get a pitying Parliament to relieve them of an unwelcomed and unsought burden. The London and District Bill has been read a second time in the House; but the instruction as to purchase is to be moved by the President of the Board of Trade at the opening of the autumn session.

There is something altogether blissful in seeing that old fugleman of the London Progressive party—Mr. M'Kinnon Wood—regarding the Company promoted Bill for bulk and power as offering not a complete municipal solution of the problem of London electricity supply, but a means of carrying out the objects of the old County Council's Bills, with, at the end of a long lane, the attainment of the ambitions of the Progressives. Times and conditions change men and manners. Mr. M'Kinnon Wood now holds an official appointment under Government. This he did not do when he fought tooth and nail for nothing short of a municipal electricity bulk and power scheme without delay. The Borough Councils, of course, do not want to be dispossessed of their right to become, at their option, the purchasing authorities of the existing private undertakings in due season under the General Electric Lighting Acts; but their opposition is now described as parochialism, and as evincing disregard of the larger interests of London as a whole. The District Bill also proposes to take in a large area outside the Administrative County of London; and the county, borough, and other authorities concerned object to any prospective encroachment on their areas by an authority who have otherwise no right there. The enormous change in the position of the question that will be introduced by the instruction as to purchase by the County Council will bring a huge opposition to Westminster; but if the Government wills, they are strong enough to carry. Opposition can therefore have no more weight than protest. It is, however, right that the protest should be on record; so that those in authority in 1931 can see that their predecessors in 1908 were not negligent. The only thing that can be said in favour of the proposed purchase clause and centralization in the County Council is that the cutting competition during the limited life of the concerns should so succeed in debilitating them that the Council will not be called upon to pay high prices for them in 1931. But though this could be used as an argument in favour, no one would put it forward as morally defensible.

Meantime, what has been making the shares of the Coalite Syndicate and of the British Coalite Company evince such remarkable ascending power this past week? Is it due to the fair amount of certainty that now exists as to the London and District Company's Bill passing? Is it because this Company propose a large generating station at Barking? Is it because gas-engines in that station will afford, rumour says, an outlet for the bye-product gas of coalite manufacture? If so, what slender hopes and prospects stimulate the share market. The demand for coalite is the important thing; not the demand for the bye-product gas. Its disposal is only a factor in reducing the price at which coalite can be retailed.

Glasgow Corporation Gas Business.

The Gas Department of the "Second City of the Empire," whose annual accounts are published in another part of the "JOURNAL," has again a record of advancement to make. Like other dealers in gas, they had to pay more for coal; the increase in the total being £97,000, and upon the ton at the average rate of 2s. 8d. Though carbonizing 1791 tons of coal less than in the previous year, 80 million cubic feet more gas were produced. The revenue, the grand total of which was £1,006,153, was an increase of £140,682. Of this increase, £97,413 was contributed by gas, £29,210 by coke, and £14,048 by ammoniacal liquor and tar. The increased revenue is, of course, largely accounted for by the advance in the price of gas by 3d. per 1000 cubic feet, which it was necessary to impose last year; but additional business also accounts for £9000. Then there was the gratifying feature of a very large increase in the return from residuals, of which larger quantities were sold, and at better prices; coke, for instance, improving by 1s. 6d. per ton. It may be pointed out, however, while the increased output of gas was 80 million cubic feet, the extra gas sold was 164 million cubic feet, and that of this quantity 116 millions were due to lighting, 40½ millions to manufacturing uses, and 12 millions more gas was supplied under contract than in the previous year. This shows unmistakably that gas for lighting is holding its ground, and that its use for manufacturing purposes, to encourage which a differential price was introduced two years ago, is advancing rapidly. There is a strong feeling in the Corporation against differential prices; but surely the result obtained—a sale of upwards of 40 million cubic feet of gas—should stifle criticism. When the return as to lighting is analyzed, it is found that, while the increased consumption through ordinary meters was 19 million cubic feet, there was an increase through prepayment meters of 94½ millions. It is only about three years since these meters were introduced into Glasgow; and it may be truly said that their success has been phenomenal. In the first year they accounted for a sale of only 3 million cubic feet of gas; while last year it was 263 millions. The average return per meter is a little over 20s. Assuming that the additional 7d. per 1000 cubic feet which is charged is necessary for the extra cost of the meter, upkeep, and collection, the yield for gas sold would be about 15s. 8d. per meter. This is not a large yield when compared with about £2 6s., which is the average derived from ordinary meters. But the turnover is large; and the prepayment meter is a good educator in the use of gas. This year the Corporation are adopting the policy (which is a new experiment with them) of returning to the prepayment consumers 3d. per 1000 cubic feet of gas consumed—this course being adopted rather than alter the mechanism of the meters. The accounts were passed by the Corporation with very little comment, which is unusual. But their satisfactory nature, which is a source of gratification to all, made their acceptance easy, particularly so when a reduction in price was being offered, in a year, too, when other rating authorities are increasing their burdens.

Tarred Roads and Motor Cars.

The question of the tar market is always with us. Sir George Livesey, it will be seen, from the report of the meeting of the South Suburban Gas Company, looks very hopefully to an improvement in the demand for tar arising from the good favour it has attained for road purposes. There is nothing like it for road purposes; and, in saying this, Sir George is echoing the words of District Surveyors throughout the country. If these officials had the right to spend money for the purpose without saying "by your leave" to the local authority, the application of tar to roads would proceed at more rapid pace than it does to-day. However, there is nothing of which to complain. A new system requires time for development. The efficacy of tar as an allayer of the dust nuisance and a protector of road surfaces has been proved; and it leads among the rivals for the purpose. The original objects for which tar was applied are served; and the list of the benefits from its use extends. Authorities say that for motor traction a tar-surfaced road, through the reduction of friction, diminishes the power required; and a diminution of power means a lowering of fuel costs. Then Dr. Sidney Turner, himself a motorist, at the South Suburban meeting, certified to roads so treated being more hygienic than the ordinary surfaced road, as well as slipless. But he complains that tar is detrimental to the india-rubber tyres of motors. It is a singular point. The motor car created the nuisance which the tar was intended to abate; and the remedy according to Dr. Turner is now a nuisance to the motor car. This looks like a turning of the tables. There is no need to consider which is the lesser evil from the point of view of the community generally; it is so very clear. But in suppressing one nuisance, all that is possible must be done

to prevent nuisance to others, though the "others" be the primary offenders. However, as is well known from experience, tar can be applied to roads in a manner that will do no harm to motor-cars. Sir George is not without a very intimate knowledge of this means of locomotion; and he says that tar can be used in a way that will not injure the tyres. If the roads are dry, so that the tar will soak well in, and the surface is covered with granite chips, and finally with sand, all will be well.

East Sussex Company—Practices of the Eaton Promoters.

One or two of the London daily papers—especially the "Financial News"—have set themselves to expose, as opportunity offers, the group of Companies in the formation of which Mr. E. Eaton, of No. 99, Cannon Street fame, has been the active spirit. Our financial contemporary did service lately in pressing upon the notice of its readers information showing the hollowness of the foundation for the claims made for the prospects of the Laindon Gas and Water Company. The same paper last week gave some particulars from the belated accounts of the East Sussex Gaslight, Coke, and Water Company, and has also published a report of the proceedings at the annual meeting of shareholders. The report forms light reading for all but the investors. The meeting was held last Saturday week at the Company's works at Heathfield, Sussex. It is obvious that there can have been but two reasons for putting the shareholders to the expense of going to Heathfield for the meeting—the one is that the shareholders, by this course, would have the opportunity of seeing the works, and, if time permitted, of enjoying the rural beauties of the district; and the other is that holding the meeting at Heathfield would prevent some shareholders attending who might have made too pertinent inquiry into the affairs of the concern. Mr. Eaton says the former reason is the true one—in fact, he thinks it is more "honest and open" to meet at the works rather than in London. "Honest and open!" The words have just about as genuine a ring as the prospectus-drawn prospects of most of the Companies in the Eaton group. This shows our doubt as to the reason offered for inviting shareholders in a London promoted Company to meet 46 miles away from the City. It is the practice of the promoters of these Companies to put inquirers into their affairs to all the inconvenience they can. In the prospectuses of some of the other flotations, it has been mentioned that the agreements and contracts can be inspected at the local offices of the Company concerned, which are generally situated at some distant and inconvenient place away from London. It was so in the prospectus of this East Sussex Company circulated in connection with a new issue of capital last January. There is another ground for doubt as to the "honest and open" motive of the Directors in holding the meeting at Heathfield. Mr. W. Wynn Evans, one of the shareholders, writing to the "Financial News," complains that he finds himself in the same boat with several shareholders in not having received a copy of the accounts or a notice of the meeting. He asks for the motive; or can it be, he cynically inquires, that, by an oversight, the meeting was held on an inconvenient date, at an inconvenient place, and at an impossible time. Truly, as he remarks, the Directors have a good deal to explain. There is another point. Why was the meeting not held until August when, as we understand, the accounts are only made up to March last?

Accounts and Directors.

The accounts of the Company cover the period from October, 1905, to the end of last March. The water supply business was started in April last year, and the gas business "about" the following August. The revenue account shows that the expenses in that period ran up to £1300; while the receipts only amounted to £257, of which £239 was for gas and water. The total loss to the date of the accounts is £2237. Moreover, preliminary expenses figure in the balance-sheet at £4773. Considering that there are debentures to the amount of £10,000, and the share capital is £15,180, these items "are rather alarming." We have to rely on the "Daily Mail" for these figures, as the Directors have not had the courtesy to send us a copy of the accounts. But we cannot complain when, according to Mr. Wynn Evans, shareholders receive the same treatment. However, the Directors must have had their tongues in their cheeks when they stated in their report that they have "every reason to believe that the shareholders will be well satisfied with the steady growth of the business and the substantial increase of the revenue *which will be shown in the next balance-sheet.*" This is funny after the poor start that has been made, and with a debenture and share capital of £25,000. One of the shareholders at the meeting—Mr. Grimes—pointed out the absence of a date to the certificate of the Auditor as to the bank balance; and this was described as a "clerical omission." The same shareholder called attention to several items in the accounts on which he wanted information. He, among other points, elicited that an amount of £90 13s. which had been incurred in law expenses was through certain Directors having been appointed whose "policy" was not in accordance with that of Mr. Eaton. The consequence was resignation. Through this, the Company were put, in one way or another, to the expense mentioned. It is not surprising that all Directors would not be in accord with the "policy" of Mr. Eaton; but Dr. Allan Maclean, who is on this Board, and has been associated with many other of these "enterprises," must be in strict accord with Mr. Eaton's "policy." Dr. Allan Maclean's name has appeared on prospectuses of the Laindon Company, Rawcliffe (Yorks) Company, Tar Solidifying and Distilling Company, the Water and Gas Debenture Share Investment Trust, Limited, and no doubt research would show that he has been mixed up with several of the other concerns floated by this group of Company mongers. However, on the East Sussex Board, Mr. Grimes, who showed such curiosity as to the accounts at the meeting, has been placed in association with Dr. Maclean and Mr. Eaton; but if he displays the same critical interest in the affairs of the Company in the future, there may not be such harmonious relations between the members of the Board as his colleagues may consider desirable for their personal comfort. Mr. Grimes takes the place of Mr. Alfred Schofield, whose absence from the meeting and cause of retirement is stated to be ill-health. We know that at least one Director of the Laindon Company some time ago retired from the Board not because of his own ill-health, but because of the ill-health of the concern. By the way, the promoters of the Kent County Gas Company, through their zeal in the promotion of Slate Quarry Companies, will stand in the dock of the Central Criminal Court very shortly.

Quality of Manchester Gas.

For some time past, a good deal of space has been occupied, at intervals, in the local Press with communications on the subject of the quality of the Manchester gas supply. Some of these have naturally been of more interest than others; and among those deserving of the greatest amount of attention at the hands of the ratepayers may be classed two letters which appeared last week in the columns of the "Manchester Courier." The first of these was written by Mr. S. Norbury Williams, who is already pretty well known as an Elective Auditor; and the second by Mr. F. W. Cooper, who also signs himself Elective Auditor, and who refers to Mr. Norbury Williams as his colleague—a condition of affairs which seems to make the difference between the two letters even more remarkable than would otherwise be the case. Mr. Norbury Williams, whose letter was the first to appear, wrote saying that he had been unable to elicit information as to the illuminating power of the gas, and the standard by which it is arrived at; and he added that at a recent Local Government Board inquiry "there was apparently a desire not to give the facts to the public." The exact point on which he stated that he sought enlightenment—in vain—was as to how the tests of the "Metropolitan" No. 2 burner differ from the test previously in vogue. It is an old saying that "one story is good until another is told;" and the remark seems fairly applicable to the present case. On reading this letter, Mr. Cooper hastened to make close inquiry on the points involved; and he adds: "I had not the slightest difficulty in obtaining answers to every question, nor was there evidence of a desire to conceal anything, particularly when it was known that my intention was to publish the information I sought." In his letter, he places before the ratepayers a quantity of information which they will do well to carefully study, but which need not be detailed here as the points are mostly ones with which our readers are familiar. The outstanding fact to which attention may be drawn, however, is this—that whereas Mr. Norbury Williams finds himself unable to ascertain what he wishes to know, "his colleague" says he has no trouble in getting any information he desires. Mr. Cooper's lengthy letter should do a great deal in the way of bringing to an end a controversy

that has gone on long enough; and even if there is still information which some ratepayers are anxious to obtain, the citizens in general will probably be reassured if they consider the fact, emphasized in the letter, that "the success of the undertaking must depend largely on the goodwill of the consumer, and that those who are most closely associated with it, having success at heart, cannot but do all that conduces to that end."

A Summary Enforcement of Demands.

Again Paris has demonstrated the facility that electricity offers to electricity workers for enforcing compliance with their demands. The city has had experiences of the same kind before. Last Thursday night, there was an unpleasant reminder of those experiences. On this occasion, however, the electrical eclipse only lasted an hour and ten minutes; but that was long enough to cause considerable loss, much inconvenience, and unlimited grumbling and forcible language. The public does not like this sort of thing; but that is the strong point for the electrical employees. They chose their time all too well. At twenty minutes to nine, when the shops, cafés, theatres, and boulevards were thronged and gay with people, without warning, all that were electrically lighted were thrown into darkness. Notwithstanding the caution given by previous collapses—intentional or otherwise—many were found who, like the foolish virgins, had not made the necessary provision; and there was the same excitable mob scampering around for supplies of oil and the primitive candle, as before. Those who were supplied with gas looked on with amusement. Those in authority over the electricity supply were quickly summoned to consider the men's grievances, and their summary means of bringing them home. With Paris in darkness, the employees promptly attained their ends; and, as Mr. Winston Churchill would picturesquely say, the street cables were soon "flushed" again with electricity. That was an expression he used when the London and District Electricity Supply Bill was up for second reading in the Commons; and the reference brings to recollection that, when this Bill was before the Lords Committee, the point was made that centralization of plant would put a power into the hands of employees to enforce their demands that was not pleasant to contemplate. However, one of the "immediate effects" of the Paris strike, says the Paris Correspondent of the "Daily Telegraph," "will be that many of the café proprietors in Paris will again have gas fitted up in their establishments, if for no other reason than that of being prepared for a renewal of last night's annoyance. Most of them sincerely regret having given up this system of lighting, which, under present circumstances, seems certainly the safest. The loss the strike caused them in the very short time it lasted was considerable; and they are not going to be caught a third time."

A Short-Lived Strike.

In last week's "JOURNAL," mention was made of a strike of 6000 men at the Powell Duffryn Company's collieries in the Aberdare Valley, in a manner, and for stated reasons, which showed the existence of a very unsatisfactory relationship between employers and employed; and attention was drawn to the contrast between the condition of things thus revealed and that which is found where co-partnership is in practice. But the Powell Duffryn strike did more than emphasize the need for a better understanding between masters and men; it struck at the very existence of the Conciliation Board, which of recent times has proved a powerful instrument in the Welsh coalfields for adjusting differences between the colliery owners and the miners—even if it has not improved the relations of the parties to such an extent as to prevent differences arising. The Powell Duffryn strike was admittedly undertaken at the instigation of the men's agent acting entirely on his own responsibility. He was invited to explain to the Miners' Federation Executive the reasons which prompted him to call out the men—which reasons were stated in last week's "JOURNAL." The Executive then discussed the matter with the Coalowners' Association; and it was decided that the deadlock was due apparently to a personal misunderstanding between the agent in question and the Powell Duffryn Company's representative. An agreement was come to that the men should return to work, and their grievances should be inquired into. The 6000 miners, their wives and families, and the shopkeepers, should be thankful that they have not been involved in ruin through a "personal misunderstanding" between two men.

GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 410.)

THE week after the August Bank Holiday did not produce on the Stock Exchange any noteworthy development, or, indeed, any marked tendency. Things ebbed and flowed and left off much as they had begun; but at any rate there was an avoidance of that depressing flatness that markets lately have sometimes known. They all reopened on Tuesday with resolute cheerfulness. As a rule, firmness was fairly maintained, and some prices looked up in response to buyers. Home Rails were cheered by indications which were regarded as favourable; and the rest generally were fair. But the gilt-edged division was not at its best; and Consols fell $\frac{1}{8}$. Next day was quiet and dull, and on Tuesday's prices gave way. Consols fell $\frac{5}{16}$; and Home Rails were depressed by a poor dividend announcement. A counter movement took place on Thursday; Consols recovering somewhat, while the markets which had been strong now weakened. Further oscillations were the feature of Friday. Consols fell $\frac{3}{16}$, and infected other gilt-edged things with debility; but some lines—notably American and South African—were in good case. Saturday was very quiet. Consols touched 86 more than once, but closed better than that. Other movements were not strongly pronounced. In the Money Market, there was an abundant supply at cheap rates. Discount was easy till near the close, when rates took a firmer attitude. Business in the Gas Market was quieter; beginning to shrink to normal August proportions. The week was, however, conspicuous for several more or less considerable advances in important issues. Foremost was Gaslight and Coke ordinary, which in the first three days was done steadily at from 99½ to 99⅝, but on Friday touched 99¼. This was the day of the general meeting; and the proceedings would appear to have heartened the market, for on Saturday the stock jumped up to 100⅜. In the secured issues, the preference was done at 107½ and 108, and the debenture at 84⅜ and 84½. South Metropolitan was not active, but very firm, and dealings rose from 120 on Tuesday to 122 on Friday. The debenture marked 84¼ and 85. Commercial also was inclined to harden; the 4 per cent. rising from 108½ free to 110. The 3½ per cent. was done at 103½; and the debenture at 81½ special. Among the Suburban and Provincial group, British changed hands at from 41½ to 42¼, Hastings 5 per cent. at 112 and 113, South Suburban debenture at 124, and Southampton at 110 and 110½. In the Continental Companies, Imperial was done at from 179¼ special to 181½, Union preference at 139 free, and European fully-paid at 22⅞. Among the undertakings of the remoter world, Bombay new marked 4$\frac{7}{16}$, Buenos Ayres 11½, Monte Video 11½, Primitiva 6¼, ditto preference 5, ditto debenture 95, and River Plate, 13⅝ and 13½.

ELECTRICITY SUPPLY MEMORANDA.

Violation of Sound Financial Principles—Obiter Dicta—Tempting the Foreigner—Street Lighting and Metallic Filament Lamps—Influence of Lamps on Consumption.

THERE have of late been several Local Government Board inquiries into applications for loans for electricity supply purposes; and from what has transpired at them, it is seen that, despite the efforts of the Board, there is still a lack of transparency in the financial methods of many municipal authorities in relation to such undertakings. This is the result of the vicious principles adopted many years since in the management of these concerns; while a few plain sound principles would have kept them altogether clear of the financial maze into which they have gradually wriggled their way. It is due to this that the Board, much to the discomfort of electrical officials, have seen fit to make a much closer scrutiny than hitherto, in every case that comes before them, of the ways in which the administrators have carried out the trust reposed in them, and to put upon their handling of finances more stringent rules, to ensure that loans are spent for the purposes for which they are granted, that there is not spending in anticipation of grants, that there is not excess expenditure, and that capital is not burdened by charges which it would be better for the concern to set against revenue. There is still complaint—sometimes of caustic character—respecting this attitude of the Board; but the Board nevertheless persist in well-doing. In some cases—not many—there is thankfulness to the Board for insisting on proper financial rules. For instance, at Harrogate there has been an inquiry by Mr. H. R. Hooper into an application for £16,500. During the proceedings, the Inspector pointed out that there had been an excess of expenditure which had not been mentioned to the Board until it was asked for. He suggested that there should be an investigation to see how the capital expenditure stood on March 25 last, and then the Corporation could start from March 26, and deal clearly with sums from that date. The Borough Electrical Engineer (Mr. G. Wilkinson) intimated that he would appreciate having a starting-point from which to proceed on a straight line. There was wisdom in this intimation—much more than was exhibited at the West Ham inquiry a few weeks ago, when officials of the Borough Council set themselves in rigid opposition to Mr. Hooper.

The "Electrical Review" the other day was saying that "it

requires no great stretch of memory to recall the days when commercial methods were regarded as outside the scope of the average municipal electrical undertaking. The necessity for a combination of technical and commercial ability in the responsible heads of such concerns was rarely considered." The past tense runs through these sentences. After, however, reading some of the reports of inquiries into recent applications for loans, there has been no necessity to exert ourselves in stretching the memory for the purpose set forth in our contemporary's remarks; and the conclusion is come to that if there was proper recognition of the "necessity for a combination of technical and commercial ability in the responsible heads" of electricity concerns, there would be less necessity for the searching investigations at the present time by the Local Government Board into the affairs of electricity concerns. But it is abundantly clear that many of the administrators of municipal electricity undertakings are of a perverse generation, and will not listen to sound advice—being governed solely by mistaken principles, by a conceited belief in themselves, or by a fear of confessed error tarnishing their own (as seen by themselves) resplendent dignity. Sound advice for such administrators was dropped by Mr. Hooper at the Tonbridge inquiry reported last week. There may be extracted from the full accounts of the proceedings (in which some of the influential ratepayers of the town took an intelligent interest) certain of Mr. Hooper's *obiter dicta*, which might with advantage displace some of the items in the existing unfortunate creed of many a management of electricity concerns. Here are a few: "Don't mind about the relief of the rates." "The first aim in connection with an undertaking of this kind is to have it financially sound; secondly, to supply cheap current; and, thirdly, if you have any money you don't know what to do with, apply it to the relief of the rates." "If you want to make this undertaking pay, you must keep the capital expenditure down." "I draw your attention to the undesirability of having capital which is not profitable." "No undertaking should go on without having a depreciation fund." There is a sheaf of excellent rules here, though they do not cover all the points of financial error in connection with the management of electricity undertakings, and which error, it is hoped, is being revealed to the perpetrators where the increase of the use of low-priced electricity is heavy, and the electricity used for lighting is on the decrease.

Necessity is the mother of invention; and necessity has developed in many managers of central electric stations a fertility of inventiveness in advertising their one commodity—electricity. The advertisements have not always been the most scrupulous. They have sometimes been carried to such an extremity in mendacity that those whom it was intended to allure have been repulsed by what they have had no difficulty, from their own experience, in properly characterizing. But we have just come across a proposal for an electrical advertisement that is legitimate in every respect. It is novel; and the Electricity and Public Lighting Committee of the St. Pancras Borough Council must receive credit for it, though we do not think there is much good to be derived from the expense projected, in view of the rival activity of estate agents in the same direction. The Committee recently called the attention of the Borough Council to the new Patent Law under which it has become necessary for all patented goods intended for sale in this country to be manufactured therein. There does not, on the first sight, appear to be much connection between this fact and the sale of electricity. But stay. As a result of this enactment, many foreign firms have already rented premises in the Metropolis for the purpose of manufacturing their patented goods; and the Electricity Committee of St. Pancras are far-seeing. There are many vacant factories available in St. Pancras, which "cheap rates" for electricity for power and lighting purposes have not tempted British manufacturers to occupy. The Committee think that by advertising in British and foreign newspapers the seductive intelligence that electric current may be had at cheap rates, some of the foreign patentees who wish to preserve their patents in this country may be tempted to locate themselves in the borough. Of course, it has not occurred to the Committee that the foreign patentee and manufacturer is likely to ask himself why, with the wonderful electrical advantages offered, there are so many vacant factories in the borough, and will seek to learn why the rejected of the Britisher is thought good enough for a foreigner. However, it is the opinion of the Committee that advertising in the manner suggested will be advantageous to the borough both from the rating and the electricity points of view. Ah! the "rating" is the sop for the Council. The Parliamentary and General Purposes Committee look upon the proposal with sympathetic eye; but the idea is one of such a momentous character that they have advised that it be carefully and solemnly examined by a Special Committee. The Council have, we read, entrusted a Special Committee with this fresh task. We wonder whether, if these tempting advertisements appear, the foreign patentees and manufacturers will give a thought to gas. Perhaps the Gaslight and Coke Company would be willing to share with the St. Pancras Borough Council the expenses of advertising, if a few good words were put into the advertisement for gas. On second thought, however, perhaps they would not.

There are a few items of information concerning the metallic filament lamps—a subject which has lain dormant the last few weeks. The first one refers to the use of these lamps for street lighting. The Beckenham Borough Council have been experimenting with them for the purpose. They want to create a bigger load for their electricity undertaking; and, whether it is to the interests of the ratepayers or not, it may be expected that they will proceed with an application to the Local Government Board for the money necessary to convert—"providing the tests are satisfactory"—the street lamps from gas to electricity in all roads where there are electric cables. The order of things now in the consideration of electricity trading municipal authorities is electricity undertakings first, ratepayers second. It is interesting to note the saving grace there appears to be in the words of the Beckenham Council, "providing the tests are satisfactory." What do the Council mean by these words? Satisfactory to the electricity undertaking, or satisfactory in respect of efficiency and cost to the ratepayers? One of the objects of the trials, we believe, has been to test the life of the metallic filament lamps; and it is understood there has been a continuous running of the lamps for the purpose of ascertaining this. If the information is correct, the test is of no value. A life-test can only be satisfactory that is carried out under the normal conditions of use; and these conditions are lighting-up and letting-down—allowing the filaments to alternately attain their soft state in use and their excessive brittleness when out of use—in all the varied circumstances of our atmospherical inconsistency. The South Suburban Gas Company will be the losers if the Council, according to their own interpretation and measure, regard the tests as "satisfactory." The Company, like many other Gas Companies, labour under the disadvantage that the electricity station is under the control of the local authority, and that the electrical official has better opportunity for ingratiating the performances of his commodity with his Council as against those of his chief competitor. However, as ratepayers, the Gas Company have informed the Council that they will have no reason to complain if the streets can be lighted by electricity giving an equal light for less cost, or a better light for the same cost; but, as a Gas Company, they let light on to their opinion by suggesting that they should be permitted to try inverted incandescent burners, so as to give a demonstration of their advantages for street lighting. The Council are not, it seems, averse to the proposal on the condition that the experiment is carried out by the Company at their own cost. Whether they will be convinced by the result is, however, a question still to be determined.

Two or three interesting statements regarding the influence on consumption of the metallic filament lamps have been published; and they confirm others that have already been referred to in the "Memoranda." Alderman Pearson, the Chairman of the Electricity Committee of the Bristol Corporation, states that notwithstanding an increase of 11,000 lamps last year, the amount of current supplied for lighting purposes was lower. Putting this alongside another remark of this gentleman, and the direction in which electrical undertakings have largely bent their financial course is seen. The growth in the demand for power, he says, has increased from 100-horse power (14 motors) in 1896 to 7103-horse power (917 motors) now. "This growth has been at a considerably greater ratio than that for light. The increase of income is not so great as if it had been from light, because the charge is so much lower." In other words, the electricity undertaking is losing in the sale of the most profitable electricity, and gaining on that which in all probability in large part contributes nothing to capital cost, management, and so forth, and in some cases does not pay so much as the average works' costs per unit of electricity sold. There are places, too, the electricity economy of the metallic filament lamp not being sufficient to compete with incandescent gas-lamps for street-lighting purposes, where it is aided by the supply of electricity at the low price of 1d. per unit. Here, again, there is no surplus on works' costs to assist in meeting the capital and other standing charges. Meanwhile, the backbone consumption—the part that has had to so considerably bear these latter charges under the marvellous tariff contortions produced by a deficiency of commercial instinct—is dwindling. The Barnsley Electricity Committee, for instance, put down a reduction of £400 in revenue last year to the adoption of metallic filament lamps. At Maidstone, however, we see that the manager is enthusiastic, in his report, "as to the way the gas mantle is being deposed by the metallic filament lamp;" and the manager's face beams over the fact that, despite the introduction of metallic filament lamps, the number of units sold to private consumers has increased by 3·5 per cent. We have not seen how this 3·5 per cent. is divided between electricity for lighting and electricity for other purposes. But about the way "the gas mantle is being deposed by the metallic filament lamp," nothing has been heard of any diminution of business on the part of the Maidstone Gas Company; and that Company would be unique if it could not show examples of the deposing of electric lamps by the gas mantle.

Mr. William Cash, F.C.A., has been elected a Director of the Worthing Gas Company, in succession to Mr. F. Blaker, who has retired.

Washing tests of coal made at the St. Louis laboratory of the United States Geological Survey show an increase in moisture of 10 to 30 per cent., a reduction in ash in the 1905 tests of 15 to 50 per cent. and in the 1906 tests of 20 to 60 per cent., and a reduction in sulphur in the 1905 tests of 10 to 40 per cent. and in the 1906 tests of 10 to 50 per cent. A raw coal containing 5·05 per cent. of sulphur had 2·47 per cent. after washing—a removal of 55 per cent. The ash in a raw coal containing 42·56 per cent. was reduced by washing to 29·67 per cent., or a total removal of 65 per cent.; and in another case from 15·72 to 10·16 per cent.

ROUND THE WORLD—AND SOME GAS-WORKS.

By Maurice Graham.

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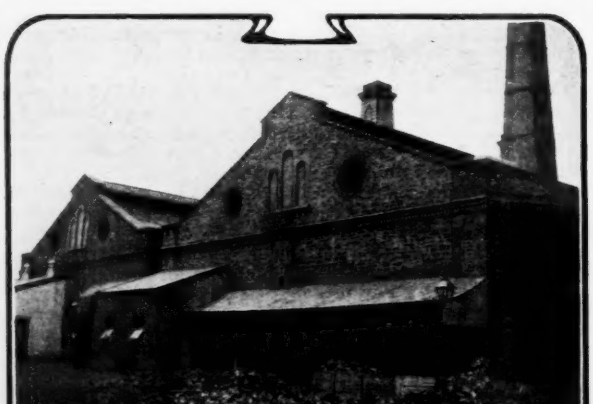
VI.—IN WEST AND SOUTH AUSTRALIA.

Leaving Colombo on Feb. 22, by the P. and O. s.s. "Moldavia," rough weather was encountered for a few days. The passengers were entirely Australians and New Zealanders. Fremantle harbour was entered on the morning of March 4. It was a pleasant sight to see the large crowds on the quay waiting to welcome the passengers. How land relieves the monotony of the sea! The people of West Australia are a homely lot, and are content with their agricultural and mining prosperity. But they are sprightly and well dressed, notwithstanding the sort of Irish-cum-Italian slouch hat they all so much admire and adopt.

Fremantle Gas-Works.

The writer was soon on shore, and proceeded to the gas-works of the Fremantle Gas and Coke Company, Limited, which supply a population of about 20,000 people. The works are only a stone's throw from the quay, and are directly opposite the railway station. Photograph No. 50 shows a view of the gas-works as they appear from the station. The works have grown so rapidly during the last year or two—owing to the large amount of building going on in the town, and as the works are in the centre of the town where land is most valuable—that the Company have wisely decided not to lay down their permanent plans just at present. They are content with erecting temporary structures and apparatus, prior to more definite changes. It was, therefore, explained to the



Photograph No. 50.—View of the Fremantle Gas-Works taken from the Railway Station.

writer that everything must be taken as being under reconstruction. The small retort-house has at present its sides and roof formed of corrugated sheeting. The retort-furnaces are of the shallow regenerator pattern; there being two beds of six retorts and two beds of five retorts, each 10 feet long. The hydraulic main and its accessories are of the usual type. Coal is received by boat, and in consequence a rather large stock has to be kept stored in the yard and also in a building adjoining the retort-house. The condensers are of the ordinary socket-and-spigot pipe pattern running nearly horizontal. The exhauster is of the Meldrum steam-jet form; and the writer was informed that it worked very smoothly with its compensating governor attached. There is a new washer and a small scrubbing apparatus. Two purifiers, 9 feet square, with water lutes, completed the purifying arrangements. A circular-shaped meter and small governor did all that was required of them. The gasholders are three in number, 120 feet, 30 feet, and 12 feet in diameter respectively, with their corresponding depths for two-lift holders.

The annual make of gas is 13 million cubic feet, and the maximum daily make 68,000 cubic feet. The illuminating power of the gas is 21 candles; and its price is 10s. per 1000 cubic feet, at which it competes favourably with the electric light generated by the Corporation. The coke is of good quality, and is sold at £2 a ton in bags. Tar also has a very good market for general purposes—such as tarring fences, asphalting, &c. The wages paid to the stokers are £3 3s. per week, and a good gas-works' labourer gets about £2.

The writer inquired at what depth the mains were laid, and was informed that 2 ft. 6 in. was the usual depth, as the pipes lay in soft sand. But, of course, where running sand was encountered, or great weights were expected to pass over them, the depth would be increased to suit circumstances. There are a good many gas-cookers and slot-meters used; and a steady trade is being done in this line.

Mr. R. S. Newbold is the Engineer and General Manager. He is an Australian, and has been associated with the Company for over twenty years, so that he can judge the present prospects very well. The great and sudden development of the frozen meat trade in West Australia, coupled with the assistance the Government are giving to emigrants who take up lands for raising sheep and cattle, means prosperity to this Western seaport. Every inducement and financial assistance are given to new settlers; so that in the near future England may look on this district as one of the greatest providers of the world. It is on account of this that one may predict a great and prosperous future for the Gas Company, which will some day have the lighting up of the stores and warehouses which will accumulate on the quay-side. Canada here has a potential rival.

Perth.

The choice of railway train or river steamer from Fremantle to Perth resulted in the former being chosen, as time was limited. At first, the impression of the land was that it was bare, having the appearance of having lately been cleared of its bush and trees; and temporary corrugated dwellings were springing up. A better impression, however, was given by the suburbs of Perth, and better still when the town itself was reached. Through the kindness of friends, a motor-car was placed at the writer's disposal, so as to see as much as possible in the time available. Both the gas-works and the electric-light works are owned and run by the Perth Gas Company, Limited, of which Mr. E. Wigglesworth is the General Manager. He has been in Perth over twenty years, and came out from the York Gas-Works. Mr. James Andrew is the Gas Engineer, and Mr. Broadbent the Electrical Engineer. Both are Lancashire men.

The gas-works, which were established in 1886, are in the centre of the city and adjoin the railway, from which lines run direct through the retort-house and coal-stores. The coal (Newcastle, N.S.W.) is brought by steamer to Fremantle, and thence by railway waggon. A stock of 1500 tons is kept in case of emergency. The retort-house is substantially built; but it is not large enough for any machinery—ordinary shovel charging being in use. The one bench contains eight beds of retorts—six beds of five retorts and two beds of six retorts, making 42 retorts in all. They are 9 feet long by 21 inches by 15 inches, and are heated by regenerative furnaces. In passing through the house, it was noticed that a well-designed one-man telpher-track was in use, which carries either coal, breeze, or coke along as required to the boiler house of the electric light works, situated across the road. A slight network over the roadway catches any small pieces that may fall; but the writer saw very little that had fallen. The operator travels in the carriage, and controls the travelling, raising, and lowering movements of the load of about 10 cwt. The power is electric; and the framework is entirely of wood. The system was designed and built by Mr. Broadbent; and its working, seen running by the writer, was perfect.

There is nothing of interest about the condensers; they being of the water-tube type. A new Pelouze and Audouin tar-extractor was noticed; and then a peep into the exhauster room showed two rotary exhausters and pumps. Passing one Livesey washer and a tower scrubber, the purifiers were reached. They are in the open air. Four boxes are 15 feet square and another four are 8 feet square—all 4 feet deep, water-sealed, and with the usual lifting apparatus. Both lime and oxide are used, but the former chiefly. There are two station meters and adequate governors.

The gasholders are the landmarks of Perth, as they stand on high ground, and can be seen for miles. They are three in number; the largest being 75 feet in diameter, and rising 40 feet—being rope-guided. The other two are each 20 feet in diameter. The total gasholder capacity is 240,000 cubic feet; the annual make of the works being 47,000,000 feet, and the maximum make per 24 hours, 200,000 cubic feet. It may be added that a new holder and other plant may shortly be required.

There is also a carburetted water-gas plant on Messrs. Humphreys and Glasgow's system, which has a productive capacity of 120,000 cubic feet of gas per day, but is used principally as a stand-by. It is placed in a nicely arranged house.

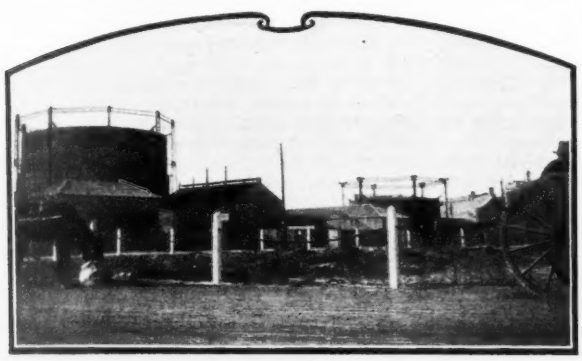
There is no real competition with the electric light, as the Company endeavour to let their customers have the best service on either system, and, of course, know their business as to the prices to be charged according to the amount of consumption of gas or current. The price of gas for lighting is 9s. 2d. (less discount) per 1000 cubic feet; and for heating, 6s. 8d. Its standard illuminating power is 15 candles; and all the public lighting is done by incandescent gas. The general increase of gas consumption amounts to about 10 per cent., which is largely accounted for by the increasing use of gas-cookers. The number of consumers reaches 970; and as the population of the area supplied is about 50,000, there is evidently scope for extension. The gas offices are a good block of buildings, and contain the usual rooms and laboratory. Mr. Andrews was unfortunately away, so that the writer has to thank Mr. Wigglesworth, jun., the Secretary, for kindly showing him round and giving information.

There appeared to the writer from his inspection of the city,

and from information gathered from influential citizens, to be every indication of good times coming. The population is rapidly increasing, and the leading business and professional men from surrounding towns flock into Perth, as they find it the essential centre for all business transactions. It is, of course, the capital of the Colony. Sir John Forrest is the leading man, and is thought a lot of and carries great weight, as one who has done his share of pioneering and exploring. After a run through some pleasant scenery along the River Swan and its mile-and-a-half width of fresh water, known as Perth Water, Fremantle was again reached, and the steamer boarded for a four days' journey to Adelaide.

Adelaide.

There is no railway connection between West Australia and Adelaide, the capital of South Australia, so that residents in the West who want to go East are compelled to make a sea voyage. The planning of the City of Adelaide is attributed to Colonel Light, who in 1837 was instructed by the Government to find a suitable site for a large town, having the best natural advantages with good water supply and easy drainage. Thus he was able to plot the beautiful squares and open spaces (now covered with flowers), and to lay out the wide streets and thoroughfares, which cross one another at right angles, and form a symmetrical city, surrounded by the hills of the Mount Lofty Range, 1800 feet high.



Photograph No. 51.—Adelaide Gas-Works—Offices on the Left; Time Office in Centre; Retort-House and Men's Bath-Room on the Right.

To-day the inhabitants of the city number 180,000. Adelaide people take life quietly among their peaceful surroundings of peach and apple orchards and vineyards. The mosquitoes were plentiful, and the heat fearful.

The offices of the South Australian Gas Company, who own the Adelaide Gas-Works and others hereafter named, are situated in the centre of the city. There the writer had the pleasure of meeting Mr. Evans, the Secretary, who directed him to the works. This necessitated a short journey by train to Bowden, where the Brompton Gas-Works are situated. The Engineer is Mr. W. Ray, who has been there over twenty years. No doubt many Lancashire men will remember him, as he came from Salford. After leaving the works' offices and crossing the coke-yard (see Photograph No. 51), the visit of inspection was commenced at the retort-houses. Of these there are four; Nos. 1 and 2 being seen in Photograph No. 52. The retort-beds here are divided into ten beds of eight retorts each and fourteen beds of seven retorts each—all on the deep regenerative principle, built to Mr. Ray's own design. There are, besides, eighteen beds of seven retorts, direct-fired. All retorts are the usual 10 feet long horizontals, with the charging done by hand, and the drawing by West's manual drawer. The most modern retort-house, with provision for charging machinery, is now [March] being extended; but no definite decision has been taken as to what system of charging shall be adopted. It is expected to have the plant all ready for May, 1909.

The coal generally used is good quality Newcastle (N.S.W.) and Maitland, and is run into the retort-house stores in trucks on the 5 ft. 3 in. gauge railway. It is also stored under substantial sheds along the railway line; the coal storage amounting to 8000 tons. The coke is quenched from overhead sprinklers and is of good colour and quality, and is picked for malting purposes. It fetches 20s. per ton. Mr. Ray says he gets his best coke from the 16-inch diameter retorts, which are still in use. He is also in favour of the coke-oven system for gas-works, more especially on account of labour troubles, which are so great in this country.

Views on Verticals and Coke-Ovens.

Certainly it seems as though the labour question in the future will be solved by the use of vertical retorts based on broad common-sense lines, and similar in design to those long since and still working in the Pumpherstone, N.B., and other oil-works. There mechanical appliances are discarded, except for the small revolving spiral or movable arms at the lower end, which the writer has proved do not break the coke. In his opinion, no vertical retort will be a success that depends on automatic coal feeding by means of revolving feeders or plungers. It can all be accomplished by gravitation. Coke-ovens will be the keen opponents of vertical retorts in the near future. These are the two possible systems to settle the stoker problem. But this is a digression.

At Adelaide the stokers get £3 3s. per week, with eight-hour shifts, and time-and-a-half for Sunday work.

There are two batteries of annular condensers, and one of Messrs. Cutler's. They are protected by special double roofs and sides covered with wire-netting, over which water flows in great quantities in the hot weather; the summer temperature being 110° Fahr.

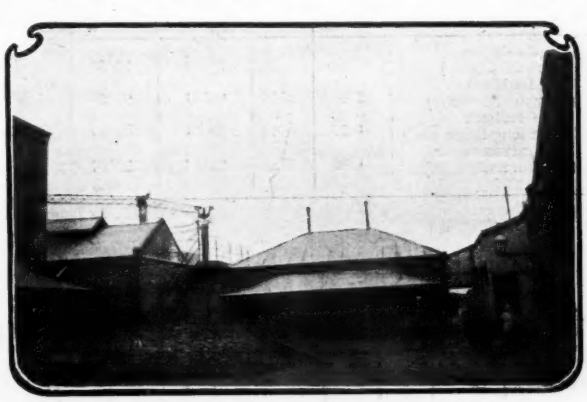
The exhauster-house is nice and tidy, and contains four machines, two of 50,000 cubic feet, one of 30,000 cubic feet, and one of 20,000 cubic feet. The Pelouze and Audouin tar-extractor is placed after the Kirkham washing apparatus, of which latter there are two—one for 1,000,000 and another for 600,000 cubic feet, besides a Livesey washer of similar size to each. Besides this, Holmes and Livesey washers of 2,000,000 cubic feet capacities have just been put in.

The purifiers are of Messrs. C. & W. Walker's designs, and consist of twelve boxes, 15 feet by 25 feet, and four boxes, 12 feet by 16 feet—all water-sealed. They are filled with oxide received from New South Wales. There are three station-meters and three of Messrs. Braddock's governors. The gasholder capacity is an ample and comfortable one for the Engineer, being equal to nearly a-day-and-a-half's make. The gasholders are three in number. The holders contain respectively about 1,000,000, 200,000, and 70,000 cubic feet of gas. The annual make of the works is 300 millions, and the maximum daily make about a million cubic feet.

The small general repairing shop, and the large meter-repairing shops, were visited and found to be exceedingly orderly throughout. Turning to bye-products, the sulphate-house is a special feature of the works. It is on Mr. Colson's design, and results in good white salt being obtained, which is shipped chiefly to Java, for sugar growing, &c.

As to public lighting, it is all done by incandescent gas. No enrichment is used; but the standard illuminating power is said to be 17½ candles. The total length of mains is about 150 miles, carrying gas to 13,000 consumers, who are increasingly appreciating gas-cookers; so that the gas consumption is mounting up at the rate of 7 or 8 per cent. per annum. Slot-meters are also in particular demand. Such is the progress made since the gas-works were first started in the year 1862.

Mr. Ray throughout his management has always looked after the comfort of his workmen in regard to lavatory and mess-room accommodation. In showing it, he said "This is up to date, and good enough for England, eh?" Besides these works, he



Photograph No. 52.—View of Retort-Houses Nos. 1 and 2.

has the following small gas-works under his charge, which also belong to the South Australian Gas Company: Port Adelaide (which carbonize annually about 2500 tons of coal), Glenelg (800 tons), Port Pirie (500 tons), Gawler (250 tons), Kapunda (250 tons), and Strathalbyn (250 tons). All these works are situated in South Australia.

This concluded the writer's stay in this Colony, and he next journeyed on to Victoria.

Meeting of Junior Gas Associations in London.—As already announced in the "JOURNAL," a Joint Meeting of the Junior Gas Associations of the United Kingdom will be held in the Congress Hall at the Franco-British Exhibition on Saturday, the 29th inst. We now learn that the chair will be taken, at 2 p.m., by Mr. H. E. Jones. Further details and programme will be issued in due course.

Subways in the City.—According to the last report of the City Engineer (Mr. Frank Sumner, M.Inst.C.E.), the total length of subways in the City of London on Dec. 31 last, was 1 mile 947 yards, and they contained about 13 miles 914 yards of mains and conduits. Of these, 2 miles 693 yards were gas-mains, and 1 mile 1638 yards were water-mains. In addition, about 1 mile 661 yards of subway in the City are not under the control of the Corporation.

STUDY OF THE CARBONIZATION OF THE CHIEF TYPES OF COAL.

REFERENCE has been made in the "JOURNAL" during the last few years to the establishment in Zürich of a State Laboratory for the testing of fuel. Dr. E. J. Constam, Professor at the Zürich Polytechnic, has been placed in charge of the laboratory. The Swiss Association of Gas and Water Engineers have also established experimental plant at the Zürich Gas-Works; and an account of some of the work carried out in this plant was given by Dr. Constam at the last meeting of the Swiss Association at Herisau. The last two numbers to hand of the "Journal für Gasbeleuchtung" contain a lengthy contribution by Dr. Constam and Herr E. A. Kolbe, of Zürich, on investigations which they have carried out on the carbonization of the more important types of coal. Though the investigation naturally deals primarily with the descriptions of coal of most direct interest to Swiss engineers, the tests cover a wide range. In some points the earlier paper of Dr. Constam, presented at Herisau, overlaps the recent communication by him and Herr Kolbe; and consequently it will be convenient to deal with the two together in the following summary of their contents. For the sake of completeness also, some figures have been included from a preliminary report which was published in the year 1906, and to which the later reports constantly refer.

Attention is drawn at the outset to the conclusions at which Dr. Constam, working in collaboration with Herr P. Schläpfer, arrived in 1906—viz., that the character of the coke resulting from the carbonization of different descriptions of coal is dependent only on the temperature and the duration of the carbonization, and is not affected by the chemical composition of the coal carbonized. The heat of combustion of the volatile constituents referred to unit weight decreases, however, as their quantity increases. Dr. Bunte and M. Saint-Claire Deville had established many years ago that when gas coals are distilled the quantity of condensation products increases with the proportion of oxygen in the coal. Later work has shown that this generalization may be extended to coal in general, and not merely confined to gas coals. The coals now more particularly studied comprise eleven varieties of coal from the north, the centre, and the south of France, a Spanish coal from the Pyrenees, and a lignite from the south of France; while five German coals and one Belgian anthracite were dealt with in the 1906 report. The composition of the coals, the course of carbonization, and the composition and heat of combustion of the products were exhaustively investigated. The details of the investigations have been given by Herr Kolbe in his thesis for the doctor's degree.

Briefly, it may be said that the coal was carbonized in charges of ½ kilo. (about 1·1 lbs.) in a small retort heated to 820° C. Immediately after charging, the temperature in the retort fell to 700° C., and then rose gradually by 35° to 40° every five minutes until, at twenty minutes after charging, the original temperature of 820° C. had been again attained. This temperature remained practically constant until the charge was drawn at the end of one hour. The coke drawn from the retorts was not quenched with water, but was run into an empty iron retort, which was quickly hermetically sealed so that no combustion ensued. Hence the moisture found in the coke was exclusively hygroscopic. The liquor was as far as possible decanted from the tar, and the latter was exposed in a desiccator over phosphorus pentoxide. It was found, however, that even after three weeks' exposure in the desiccator the tar retained some moisture; and hence the proportion of hydrogen given in the analyses of the tar is higher than it should be for dehydrated tar. The gas produced from each charge was measured, and its specific gravity and calorific value determined; while samples were sealed in glass tubes for subsequent analysis. Carbonization was completed in an hour. The French coals studied ranged in composition between that of Gardanne and that of La Mure. Table I. gives the more important analytical data relating to these two coals, as well as that of the richest German gas coal (Gladbeck) and the Belgian anthracite (Amercoeur). Table II. shows the distribution of the products of carbonization for the 19 varieties of coal.

TABLE I.—*Composition of the Most Widely Different Types of Coal.*

Origin of Coal.	Percentage o			Composition of Combustible Matter.					Yield per Cent. of Combustible Matter of		Calorific Value of Combustible Matter. B.Th.U. per Pound.	
	Moisture.	Ash.	Combustible Matter.	Carbon.	Hydrogen.	Oxygen.	Nitrogen.	Sulphur.	Coke.	Volatile Matter.	Gross.	Net.*
Gardanne (French lignite)	10·55	10·79	78·66	73·31	5·06	14·00	1·63	6·00	50·6	49·4	12,981	12,346
La Mure (French anthracite)	3·48	3·41	93·11	95·38	1·58	1·36	0·45	1·23	95·7	4·3	14,743	14,551
Gladbeck (German long-flame coal)	1 57	6·42	92 01	85·96	4·87	6·30	1·20	1·67	67 99	32·01	15,039	14,562
Amercœur (Belgian anthracite)	1·23	3·75	95·02	93·04	3·37	1·73	1 12	0·74	91·20	8·80	15,564	15,237

* Gross calorific power, less heat of vaporization.

TABLE II.—*Products of Carbonization of the Different Coals.*

—	French.			French.										Ruhr.					Belgian.
Origin of Coal . . .	Gardanne.	Chapelle-sous-Dun.	Pyrenean.	Bruay.	Blanzy.	St. Etienne.	Lenz.	Ronchamp.	Grand' Comte.	Meurchin.	Epinac.	Ostricourt.	La Mure.	Gladbeck.	Flötz Robert.	Sonnenschein.	Girondelle.	Mausegatt.	Amerceur.
Average yield of—																			
Coke . . per cent.	50·60	56·60	57·15	62·10	65·40	70·35	72·00	77·90	79·80	87·35	89·15	89·65	92·60	68·14	77·60	80·93	84·41	87·38	90·12
Gas . . ,,	25·60	20·90	21·45	20·95	18·65	16·20	16·70	14·80	13·80	7·10	6·15	6·85	3·35	15·99	13·68	13·55	12·51	10·83	7·71
Tar . . ,,	4·55	5·12	6 90	8·10	6·50	7·10	5·10	5·30	3·20	1·10	..	..	..	6·47	4·81	2·60	1·28	0·12	..
Retort pitch ,,	2·00	0·90	2·60	2·80	1·80	2·00	2·00	1·10	0·60	0·55	..	..	..	1·46	0·71	0·67	0·25	0·20	0·12
Liquor . ,,	16·45	16·08	11·70	6·00	7·40	4·25	4·2	0·90	2·60	3·90	4·70	3·50	2·55	7·94	3·20	2·25	1·55	1·47	2·05
Unaccounted for p.ct.	0·80	..	0·20	0·05	0·25	0·10	..	..	..	..	..	..	1·50						
Gas per ton of coal—																			
Cubic feet, at 60° Fahr. and 30 in. .	12,619	11,410	11,709	12,134	11,633	12,468	12,524	11,345	11,046	11,004	8,490	10,158	310	10,279	10,864	11,278	10,473	9513·8	7849·20
Specific gravity of gas	0·5950	0·5351	0·5378	0·5060	0·4697	0·3813	0·3913	0·3826	0·3658	0·1893	0·2124	0·1976	0·3181	0·4562	0·3692	0·3525	0·3503	0·3359	0·2878

A comparison of the carbonizing results with the analytical data shows clearly that the higher the proportion of oxygen in the combustible material, the higher is the weight of volatile constituents obtained and the smaller the quantity of coke—that is to say, the proportion of water contained in the coal in the air-dried state is higher the greater the proportion of oxygen in the combustible material. Only one coal—viz., that of Blanzy—forms an exception to this generalization. It is obvious from the fact that the quantity of coke produced ranges from 50·6 to 95·7 per cent. of the combustible material, that the investigation included all varieties of coal from the long flaming lignite to the least gaseous anthracite. The yield of tar from the French coals ranged from 1·1 to 8·1 per cent.; and in all cases the tar was heavier than water. The tars obtained in the experiments were, generally speaking, of higher density than those obtained on gas-works from the same descriptions of coal—doubtless owing to the closer contact of the products of distillation with the hot walls of the small retort. The coals which are older geologically and are poor in oxygen yield less, but more dense, tar, than the coals rich in oxygen. Broadly, the higher the specific gravity of the tar, the greater is the quantity of free carbon contained in it.

The calorific value, as well as the elementary composition of the tars, was determined. The pitch formed in the mouthpieces of the retorts was examined; the melting point being determined in all cases, and the specific gravity where possible. The melting point ranged from 105° to 129° C. (221° to 264° Fahr.) and the specific gravity was, for example, for the Blanzy coal, 1·252, and for the Bruay coal, 1·271. The highest yield per ton of coal was given by the St. Etienne coal, and the lowest by the La Mure anthracite. The Gardanne lignite yielded gas of the highest

specific gravity—viz., 0·5995. The quantity of gas made was observed at intervals of five minutes, and curves were drawn from these observations showing the rate at which gasification took place throughout the period of carbonization. The study of these curves indicates that the evolution of gas during the first ten minutes is greater the more volatile matter there is in the coal distilled; the more the coal approximates in composition to smithy coal, the more protracted is the evolution of gas. The anthracite coals which give but little gas are relatively quickly carbonized. It appears that with all the varieties of coal, the greater part of the gas produced was evolved in the first twenty-five minutes of the sixty minutes which were allotted for the complete carbonization. In most cases the curves showing the rate of evolution of gas are fairly regular; but in one or two instances there are distinct indentations. The coke produced from the French coals contained from 0·16 to 3·63 per cent. of moisture and from 3·84 to 27·11 per cent. of ash, and the combustible material present ranged from 73·26 to 95·81 per cent. Regarding only the combustible material, the extreme proportion of each constituent found in any of the samples is shown in Table III.

TABLE III.—*Constitution of Combustible Matter of the French Coals.*

—	Highest.	Lowest.	Mean.
Carbon per cent.	97·30 (Blanzy)	93·93 (Pyrenean)	96·50
Hydrogen ,,	1·16 (Pyrenean)	0·62 (Ronchamp)	0·84
Oxygen ,,	0·84 (La Mure)	0·15 (Ostricourt)	0·44
Nitrogen ,,	2·04 (Grand' Combe)	0·42 (La Mure)	1·23
Sulphur ,,	3·10 (Pyrenean)	0·26 (Blanzy)	0·99
Calorific power B.Th.U. per lb.—			
Gross	14,668 (Chapelle-sous-Dun)	14,274 (Chapelle-sous-Dun)	14,463
Net	14,567 (Pyrenean)	14,191 (Pyrenean)	—

The proportion of ash in the coke from the German coals ranged from a maximum of 10·32 per cent. (Gladback) to a minimum of 3·07 per cent. (Sonnenschein). The maximum and minimum proportions of each constituent in the German and Belgian coals and the calorific power are shown in Table IIIA.

TABLE IIIA.—*Constitution of Combustible Matter of the German Coals.*

—	Highest.	Lowest.
Carbon per cent.	97·04 (Sonnenschein)	95·81 (Gladbeck)
Hydrogen ,,	1·08 (Gladbeck)	0·59 (Sonnenschein)
Oxygen ,,	1·12 (Amercoeur)	0·04 (Girondelle)
Nitrogen ,,	1·70 (Girondelle)	1·10 (Amercoeur)
Sulphur ,,	1·20 (Gladbeck)	0·65 (Sonnenschein)
Calorific power, B.Th.U. per lb.—		
Gross	14,492 (Gladbeck)	14,342 (Amercoeur)
Net	14,405 (Flötz Robert)	14,248 (Amercoeur)

The values found for the composition and calorific value of the coke confirmed the earlier conclusions that, almost without exception, these values are independent of the chemical composition of the coal substance, and depend primarily on the temperature and duration of carbonization. The mean composition of the combustible material of the French cokes examined is also given in Table III. The Pyrenean coal shows a considerable deviation from the mean in the proportion of carbon in the coke; but this is due to the abnormally high proportion of sulphur in this coal.

There is very little available information on the elementary composition of the pitch from retort mouthpieces, and it was therefore investigated somewhat thoroughly. The tabulated analytical results show that in general an increase in the proportion of fixed constituents in the coal is attended by an increase in the proportion of carbon in the pitch; while the proportion of oxygen and nitrogen, as well as that of sulphur, in the coal is reflected in the pitch. The heat of combustion of the pitch increases and decreases with the amount of carbon present in it. Eliminating the small quantities of ash, the pitch contained from 85·89 per cent. (Pyrenean coal) to 91·63 per cent. (St. Etienne) of carbon; from 4·37 per cent. (Meurchin) to 4·90 per cent. (Bruay) of hydrogen; from 3·10 per cent. (St. Etienne) to 6·50 per cent. (Chapelle-sous-Dun) of oxygen and nitrogen; and from 0·56 per cent. (Lenz) to 3·62 per cent. (Pyrenean) of sulphur.

The tar which separated in the condenser was examined as to its composition and calorific power. It contained very little ash. The tar proper—*i.e.*, ash free—consisted of from 74·74 per cent. (Lenz) to 89·37 per cent. (Meurchin) of carbon; from 5·12 per cent. (Pyrenean) to 6·09 per cent. (Lenz) of hydrogen; from 3·75 per cent. (Meurchin) to 18·46 per cent. (Lenz) of oxygen and nitrogen; and from 0·56 per cent. (Chapelle-sous-Dun) to 5·18 per cent. (Pyrenean) of sulphur. The lowest gross calorific power was 13,323 B.Th.U. per lb. for the tar from the Lenz coal, and the highest, 16,194 B.Th.U. per lb. for that from the Meurchin coal. On plotting out the results, it appeared that the amount of carbon in, and the heat of combustion of, the tar proper increased as the proportion of fixed constituents in the coal carbonized increased. The tars from the Lenz and Ronchamp coals were exceptions to this generalization, owing probably to the fact that they yielded very little liquor, and hence the greater part of the oxygen in these coals accumulated in the tar. The coals which contained most sulphur yielded tar rich in sulphur. For the sake of comparison, two tars produced in the ordinary course of working on the Zürich Gas-Works were examined, and found to contain 0·53 and 0·56 per cent. of sulphur. The tars produced in the experimental plant contained much less hydrogen and oxygen than those produced at the lower temperature of 450° C. by Börnstein in investigations which he made in the year 1906 on some German coals;* but this is not very surprising having regard to the dissociating effect of the higher temperature on the primary products of carbonization.

The specific gravity of the gas was determined half-an-hour after carbonization had finished by means of Pannertz's apparatus, and the calorific power by a Junkers calorimeter. The samples of gas in sealed glass tubes were analyzed in a Pfeiffer apparatus. The mean results obtained for each coal are given in Table IV. It will be seen on reference to this table that the higher the yield of gas is from the coal, the greater are the proportions of carbonic acid, heavy hydrocarbons, carbonic oxide, and methane in the gas, and consequently the higher is its specific gravity. On the other hand, the proportion of hydrogen in the gas and, speaking generally, the calorific power of unit weight of the gas, decreases as the make of gas increases. The investigations, however, showed that two coals containing the same proportion of volatile constituents can yield gas of different composition and calorific power—*cf.*, Bruay and Blanzy coals, both with 38 per cent. volatile matter, and Flötz Robert and Grand' Combe coals, both with 22 per cent. volatile matter. It appears, therefore, from these instances that the general rule as to the dependence of the heat of combustion of the gas on the yield is subject to numerous exceptions.

From the experimental results already summarized in the foregoing tables, a heat-balance for the carbonization of each coal has been drawn up in the following manner. The different products

* See "JOURNAL," Vol. XCV., p. 839, Table IV.

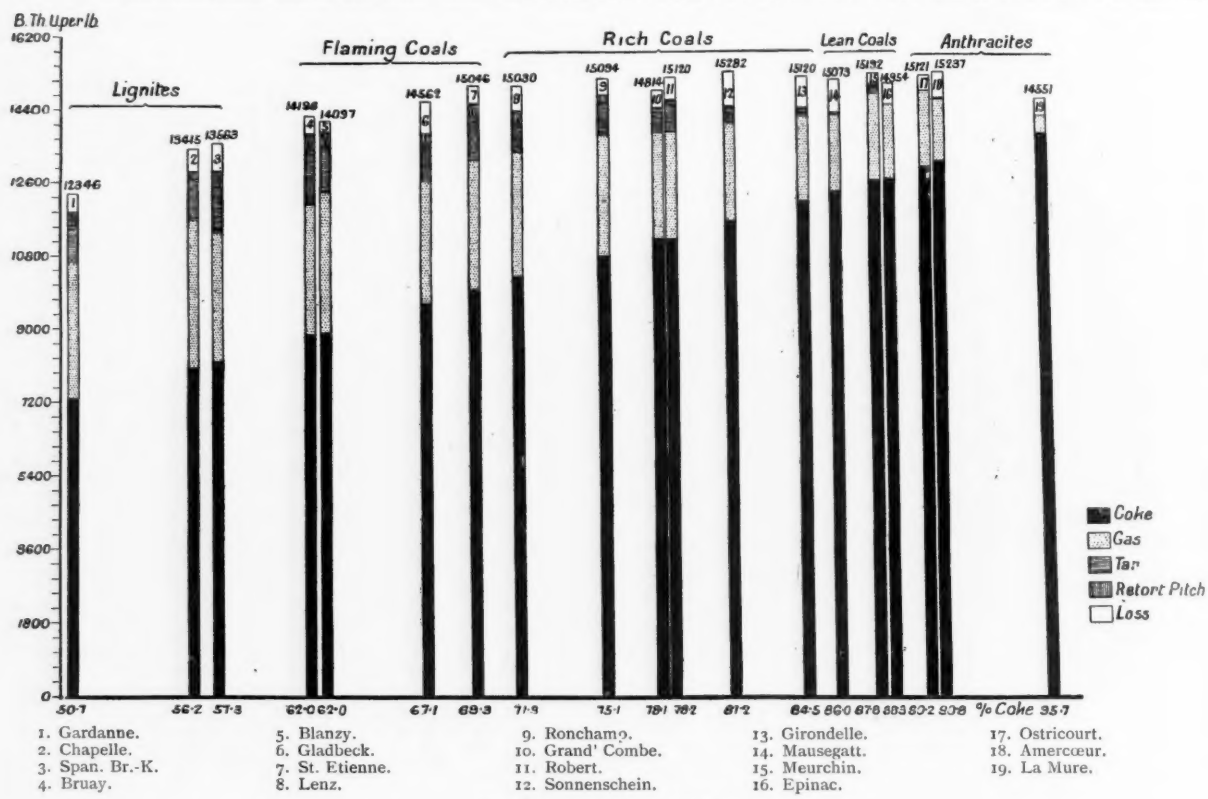
TABLE IV.—*Specific Gravity, Calorific Power, and Composition of the Gas Obtained.*

Origin of Coal.	Average Yield of Gas.	Specific Gravity.	Calorific Power Gross. B.Th.U. per Cubic Foot.	Carbonic Acid.	Heavy Hydrocarbons.	Oxygen.	Carbonic Oxide.	Methane.	Hydrogen.	Nitrogen.
	Per Cent.			Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
French—										
Gardanne	25·6	0·5950	512	9·47	4·75	0·28	18·42	20·70	42·53	3·85
Chapelle-sous-Dun	20 9	0·5351	588	5·37	6·48	0·70	15·21	23·36	46·26	2·62
Pyrenean	21·4	0·5378	599	5·13	6·40	0·45	15·43	24·30	45·09	3·20
French—										
Bruay	20·9	0·5060	596	3·42	4·60	1·02	15·50	22·67	48·57	4·22
Blanzy	18·7	0·4697	610	3·12	5·30	0·30	10·32	27·63	50·92	2·41
St. Etienne	16·2	0·3813	598	2·06	4·07	0·75	5·97	31·33	50·85	6·97
Lenz	16·7	0·3913	579	2·20	4·50	0·75	5·40	26·70	57·23	3·22
Ronchamp	14·8	0·3826	552	1·90	3·90	0·50	6·82	23·90	60·36	2·52
Grand'Combe	13·8	0·3658	520	2·43	3·10	0·45	10·40	21·80	60·42	1·40
Meurchin	7·1	0·1893	472	1·00	1·30	0·60	3·56	17·32	71·86	4·36
Epinac	6·1	0·2124	449	1·45	0 60	0·30	4·02	16 84	71·90	4·89
Ostricourt	6·8	0·1976	442	0·87	0 67	0·50	3·29	15·65	76·61	3·41
La Mure	3·3	0·3181	321	5·25	0·15	0 30	11·11	2·82	76·29	4·08
Ruhr—										
Gladbeck	16·0	0·4562	654	2·37	6·91	0·97	9·28	30·59	45·70	4·18
Flötz Robert	13·7	0·3692	571	2·46	4·60	0·78	6·66	25·13	54·35	6 02
Sonnenschein	13·5	0·3525	507	1·88	3·33	0·60	7·75	21·31	62 73	2·40
Girondelle	12·5	0·3503	474	2·72	2·28	0·59	7·33	19·59	63·60	3·89
Mausegatt	10 8	0·3359	463	3·70	1·68	0·78	3·46	16 69	65·86	7·83
Belgian—										
Amercœur	7·7	0·2878	461	0·60	1·c9	1·22	3·36	19·00	66·68	8·05

TABLE V.—*Calorific Balance of Carbonization.*

[The figures represent the calorific value of each product as a percentage of the calorific value of the coal carbonized.]

—	French.			French.										German.					Belgian.
	Gardanne.	Chapelle-sous-Dun.	Pyrenean.	Bruay.	Blanzy.	St. Etienne.	Lenz.	Ronchamp.	Grand' Combe.	Meurchin.	Epinac.	Ostricourt.	La Mure.	Gladbeck.	Flötz Robert.	Sonnenschein.	Girondelle.	Mausegatt.	Amercœur.
Coke	55·6	59·8	58·80	59·6	60·2	65·3	68·9	69·3	76·0	82·1	84·3	84·5	93·5	66·06	74·35	76·54	80·07	81·65	85·0
Gas	27·2	27·0	23·10	22 1	24·4	21·2	20·6	19·4	17·4	14·0	11 3	12·3	2·9	20·62	17·39	15·75	13·72	12·41	10·1
Tar	7·0	7·5	8·30	9·3	8·3	7·2	4·5	5·4	3·5	1·2	..	..	..	5·96	4·57	1·97	1·04	0·16	..
Pitch	3·0	1·3	3·12	3·0	2·3	2·0	2 3	1·4	0·5	0·5	..	..	..	1·60	0·68	0·64	0·24	0·11	0·1
Loss	7·2	4·4	6·68	6·0	4·8	3·3	3·7	4·5	2·6	2·2	4·4	3·2	3·6	5·76	3 01	5·10	4·93	5 67	4·8



1. Gardanne.
2. Chapelle.
3. Span. Br.-K.
4. Bruay.
5. Blanzy.
6. Gladbeck.
7. St. Etienne.
8. Lenz.
9. Ronchamp.
10. Grand' Combe.
11. Robert.
12. Sonnenschein.
13. Girondelle.
14. Mausegatt.
15. Meurchin.
16. Epinac.
17. Ostricourt.
18. Amercœur.
19. La Mure.

Heat Balance of Coal Distillation.

have been taken in percentages by weight of the coal carbonized and multiplied by their calorific power. From the product, the calorific value of each product is deduced as a percentage of the calorific value of the coal. The results for each coal are summarized in Table V. Mahler was the first to give a heat-balance for the carbonization of coal. In 1892, he investigated a gas coal from Commentry and found a loss of 3·55 per cent. of the total heat of the coal. Poole, in 1898, found, with an American coal, a loss of heat of 3·06 per cent. The 1906 report on the five Westphalian and one Belgian coal showed an average loss of 3·70 per cent.; while the mean for the French coals now examined is 4·4 per cent., or, omitting the Gardanne lignite and the Pyrenean coal, 3·90 per cent.

Above are shown graphically the figures for the heat-balance of each of the coals dealt with. The abscissæ refer to the yield of coke as a percentage of the ash-and-water-free coal; the ordinates represent B.Th.U. per pound. The blackened portions of each column show the net calorific power of the fixed constituents of the combustible material; the dotted parts show the calorific power of the gas resulting from the combustion of unit weight of the pure coal; the horizontally-shaded portions show the calorific value of the tar, and the vertically-shaded portions that of the retort-pitch; while the blank portions represent the loss. From the diagram it is clear that the calorific value of the coals increases with the proportion of fixed constituents in the coal substance until it attains a maximum with coals containing about 18 to 22 per cent. of volatile matter. The lean, or anthracitic, coals have a lower calorific value on the water-and-ash-free basis than the semi-fat and fat, or rich, coals; but a maximum is again reached with the true anthracites. The gradual rise in the calorific value of the fixed constituents of the coal substance shown in the diagram expresses graphically the conclusion arrived at, that the chemical composition and calorific value of the pure cokes produced under similar conditions are practically constant for different varieties of coal. The diagram also indicates that the heat of combustion and calorific value of the gas decreases as the proportion of fixed constituents in the coal increases; but this law is not without exceptions. Further, that the heat produced by the combustion of the whole of the gas is not a function of the quantity of fixed or volatile constituents in the coal. The less volatile matter the coal contains, the less tar and pitch result from its carbonization.

Goutal has proposed an empirical formula for calculating the heat of combustion of coal from its proximate analysis, but the investigations carried out in the Zürich laboratory indicate that no such formula can be established for all varieties of coal, as there does not appear to be any factor expressing the relationship between the chemical composition of the volatile constituents of coals and their heat of combustion. The very numerous investigations made in the Zürich laboratory show that the composition of the volatile constituents of samples of coal containing exactly the same amount of volatile matter varies greatly, especially with long-flaming more recent coals, such as Saar coals. The calorific values of such coals determined in the calorimeter show differences of from 500 to 700 B.Th.U. per pound; but it may be shown that the modified Dulong formula adopted by the German Union—viz.:

$$81\ C + 290\left(H - \frac{O + N}{8}\right) + 25\ S - 6\ W$$

gives values which in almost all cases approximate very closely to those found by the calorimeter. It has already been stated that coals with 18 to 22 per cent. of volatile matter and the true anthracites possess the highest calorific power. It will be seen from the diagram that the heat produced on combustion arises in the case of anthracites almost wholly from the heat of combustion of the fixed carbon, while with the rich coals a considerable part of the heat developed arises from the volatile constituents. This circumstance explains the fact that with ordinary grates and hand-firing these powerful heating coals show the smallest losses by the chimney and give the best evaporation. This has been established in evaporation tests on locomotive, marine, and

stationary boilers. An anthracite of the same calorific power is much inferior for evaporative purposes, because it requires a much greater excess of air to burn it. The long-flaming coals can be burnt with a relatively small excess of air, and hence there is less loss of heat by way of the chimney. But the more volatile constituents there are in the coal, the greater is the loss under the boiler through the escape of incompletely burnt gases. The best evaporative results are obtained with the coals of which the coal substance contains from 18 to 22 per cent. of volatile matter. The heat-balances given in Table V. indicate the heat losses likely to occur with the different types of coal, and so afford a criterion of their relative utility as boiler fuels.

A point of interest to gas engineers is that the researches have divulged an easy method of determining the calorific value of gas coke. A gramme of the finely-powdered coke is taken, and heated for two hours in a platinum crucible at 110° C. The loss of weight represents the moisture in the coke. The dried portion is heated to incandescence in the crucible until the combustible matter is burnt off, and the residue is the ash in the coke. If, for instance, the moisture is 1 per cent., and the ash 9 per cent., the coke may be considered good. There is in it 90 per cent. of combustible matter. It has been established by these investigations that the gross calorific power of the combustible matter of all cokes produced under the uniform conditions of the experimental gas plant is practically constant at about 8000 calories per kilogramme (14.400 B.Th.U. per pound). Hence by multiplying the proportion of combustible matter by its constant calorific power—viz., in the example $\frac{90}{100} \times 14400 = 12960$ B.Th.U. per pound—we obtain forthwith the gross calorific power of the coke within 1 per cent. of the truth. A deduction of 90 B.Th.U. would give the net calorific power. In using this method, it must be borne in mind that the coke must be true coke—*i.e.*, not imperfectly carbonized—and that a high proportion of sulphur in the coke would vitiate the result, since 1 per cent. of sulphur in the dry ash-free coke means a falling off in calorific power of rather over 100 B.Th.U. per pound.

INTEGRATING PHOTOMETERS.

The following is an abstract translation of an article by Dr. Hugo Krüss, of Hamburg, which appeared in a recent issue of the "Journal für Gasbeleuchtung."

The Ulbricht spherical photometer is in the truest sense an integrating photometer. The illuminating intensity shown in the observing window of this apparatus is proportional to the whole of the light emitted by a source of light placed in the sphere. It, in fact, sums up the illuminating power emitted in all directions; but the application of this sphere is greatly hindered by the fact that for large sources of light the sphere must be of comparatively large dimensions, so that it cannot well be set up in the limited space of an ordinary photometer room. It is generally accepted that the greatest want of uniformity in the light emitted from a source is in the vertical plane. It is customary to be content with making measurements in different directions on this plane. But if there is great want of symmetry in the light emitted in the horizontal plane through the source, measurements are made not only in the single meridian plane, but in several. For these measurements one mirror or a series of mirrors, which reflect the light emitted in any one direction on to the photometer disc, are used. Determinations are thus made in a great number of directions of the semicircle, or of the whole vertical circle, by moving the mirror in turn to the necessary positions. The final result, which expresses the mean hemispherical or spherical illuminating power, is deduced by calculation from the results so obtained. By this method, single measurements in different directions give the important information as to the polar curve of the light radiation from the source.

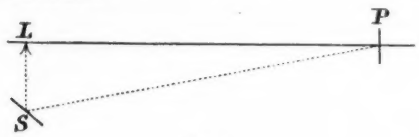


Fig. 1.

The simplest of these devices is a single mirror as first employed by Hefner-Alteneck. A mirror S (fig. 1) is placed at the side of the source of light L, at such an angle to the photometer axis LP that it reflects the light of the source L on to the photometer disc P. The mirror can be brought to different positions about the photometer axis, so that the intensity of the light can be measured in different directions in the vertical plane through the source of light. If the mirror could be rotated very rapidly, it would be possible to obtain the mean intensity in this vertical plane by a single measurement. Brodhun has used such a method for determining the mean horizontal illuminating power of electric glow lamps; but with very powerful sources of light, the circle of rotation would be so large that the method could scarcely be employed. Hence a number of mirrors fixed at distances of (say) 15° or 10° on the circle have been substituted for the single rotating mirror by, among others, Blondel and Matthews. By such a circle of mirrors the sum of the intensities of light in 24 or 36 different directions is measured on the photometer screen. On dividing the result thus arrived at by the number of mirrors, the mean vertical illuminating power of the source is obtained; but to get the mean spherical illuminating power, the measurements must be made with the circle of mirrors in different horizontal directions, and the mean taken, unless the light radiated in all directions of the horizontal plane happens to be uniform.

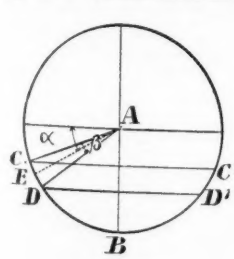


Fig. 2.

The mean spherical illuminating power is not, however, forthwith obtained by this method, as will be seen from the following considerations: In fig. 2, A is the source of light and AB the vertical axis through it. If C and D are the positions of two mirrors, then the angle CAD = β is a measure of the interval between them. Then if r is the radius of the circle of mirrors and α the angle which the line AE, which bisects the angle β, makes with the horizontal, and I_a the illuminating power in the direction α, the illumination on a unit of the circle is $\frac{I_a}{r_2}$. Then I_o being the mean spherical illuminating power, the sum of the measurements I_a in different directions should be equal to I_o. But it may be demonstrated geometrically that the values I_a must be multiplied by cos α in order to make their sum equal to I_o. Consequently a circle of mirrors for the determination of mean spherical illuminating power must have a device which takes account of the factor cos α; and it is these devices which constitute the difference between the various circles of mirrors devised by different photometrists.

Blondel enclosed the source of light in an opaque sphere which had horizontal slits at distances corresponding to the distances of the mirror in the circle from the equator. The length of the slit is proportional to the factor cos α. If the sphere is rotated about its vertical axis so rapidly that there is no flickering, evidently the single mirror gives quantities of light proportional to cos α. Bearing in mind that the slits near the equator only make up a small part of the surface of the sphere, it follows that this apparatus causes considerable diminution of the light. The rotation required also makes this form of Blondel photometer both complicated and costly. Matthews uses two mirror half circles placed at right angles to one another, with their centre at the same height. In the centre of one half-circle the source of light is placed, and the mirror of this half-circle reflects the light on to the mirror of the second half-circle, which is in front of the other, whence it is projected to the centre of the second half-circle, where the disc of the photometer is placed. The rays thus strike the disc at the angle corresponding to that of the mirrors. According to Lambert's law, the intensity of illumination of a surface is proportional to the cosine of the angle of incidence, and the factor cos α is known. The fact that Lambert's law is not strictly applicable to large angles of incidence is overcome by Matthews in this manner: The distance of every two co-operating mirrors of two circles, which thus form an angle of the mirrors and are closely joined, can be corrected from the centre of the circles within certain limits corresponding to the deviation from cos α.

In a circle of mirrors intended for testing arc lamps at the Electrical Testing Laboratory in New York, Matthews has taken account of the factor cos α by introducing a smoked glass in the line of each ray of light. This glass, by absorption, reduces the intensity of the light in the ratio of the cosine of the angle of the particular mirror. This arrangement has the advantage that the circle of mirrors does not bring together the light emanating from the source until it reaches the photometer disc if the latter is set up at a particular distance from the circle dependent on the inclination of the mirrors. Equality of illumination of two sides of the photometer disc is obtained by moving the sources of light and not by moving the disc. Moreover, the factor cos α is not taken into account in a very simple manner. The Matthews circle of mirrors is not truly an integrating photometer. The author proceeds to describe a modification of it. There is a semi-circle of a number of small mirrors at the centre of which the source of light is placed. One of these mirrors (S) is shown in fig. 3 in relation to the source of light (L). The semi-circle can be set up either vertically or horizontally, and a complete circle may, if desired, be used instead of it. The mirrors project the light from the source on to a number of object glasses (O) disposed to one another in the same way as the mirrors.

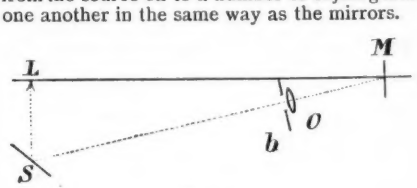


Fig. 3.

These object glasses throw the images of the source of light on to a matt-surfaced disc (M), which is placed parallel to the plane

of the circle of mirrors. These images are all superimposed so that the total radiation of light in different directions is obtained. The images, however, are not equally sharp in all parts, as the disc is not at right angles to the optical axis of the object glass. This, however, does not matter in the present case, as it is only the illumination of the disc, and not a sharp impression, that is required. The intensity of illumination of this disc is determined on a bar photometer. In front of each object glass there is a screen (*b*), the area of the opening in which is proportional to the cosine of the angle, which is that of the mirror corresponding to the object glass. Thus the brightness of the images of the source of light produced by the object glass is degraded according to the value of cos α. Means are provided for rotating and adjusting the screens. In determining the mean spherical or hemispherical intensity, a factor must be introduced for the loss of light in the mirrors, object glasses, and matt-surfaced screens. The apparatus admits of any object glasses being cut out by shutting the corresponding screen. Thus measurement may be made with only one object glass; and the polar curve of the light radiated by the source may thus be determined.

It is very important that the matt-surfaced disc should be of the proper material. Ground or etched glass lets a considerable amount of the light through; so that the photometer measures the light directly transmitted, as well as the illumination of the disc. Moreover, the rays strike the disc at an angle of about 20° to the perpendicular. Experiments showed that a finely-etched glass plate gave 3 per cent. of the illumination at this angle; and a coarsely-ground glass plate, 13 per cent. Consequently such glass must not be used, but only milk glass, which does not transmit light, and so can be used in photometry simply on the basis of the law of the decrease of illumination with the square of the distance. But milk glass absorbs much light; and, consequently, apparatus in which it is employed can only be used

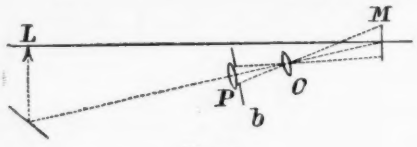


Fig. 4.

for high-power lights. It is easy, however, by a small change of the optical part of the apparatus, to substitute for the disc M the actual disc of the photometer or the milk glass plate of the Weber photometer. For this purpose a system of lenses must be used as shown in fig. 4. The lens P produces an image of the source of light L in the principal axis of the object glass O, which is of such diameter that it can receive the whole image. Immediately behind the lens there is a screen *b*, the area of the opening of which is proportional to the cosine of the angle α of the corresponding mirror. This screen thus makes the light used proportional to the factor cos α. The total length of the object glass O is such that it projects from the opening in the screen an image of a particular size at M. If lenses corresponding to P and O are similarly introduced for all the mirrors, then the images reaching the plane M will all have the same size. The surface illumination of each of these images is the same at all points, and, consequently, that of the sum of the superimposed images is the same also. Therefore the disc in the position of the plane M may be that of a Lummer-Brodhun photometer, or of a Weber photometer, and the measurement may be made in the usual way. The constant of the apparatus may be determined by using a source of light of which the mean spherical illumination has been already ascertained. It may be assumed that the loss of light is alike in all the elements of the apparatus; and thus the one constant will apply whether the measurement being made is of the light radiated in a single direction or over a large angle.

Mysterious Fires.

Fires (an editorial in the "Daily Telegraph" last Saturday says) often occur mysteriously nowadays. In the old days the causes were usually tolerably certain. For these mysterious outbreaks some fusion of a hidden electric wire or some defect in the warming installation is generally held to be responsible; and it is a moot point whether the danger from such sources is not greater than when charred oak beams in the chimneys were the principal latent source of mischief. We talk of the perils of lamps and candles, but they are at least open and visible; the electric wire is out of sight, and the majority of people scarcely realize that fire, as well as light, can lurk in so innocent-looking a thread. It behoves all who have the care of buildings of historic interest to take warning by these repeated losses, and make the fullest possible provision against the outbreak of fire.

The President of the Board of Trade has appointed Lord Rayleigh (the Chief Gas Examiner for the Metropolis), Professor J. J. Thomson, F.R.S., Dr. R. T. Glazebrook, F.R.S., Sir John Gavey, C.B., and Mr. A. P. Trotter to be the British delegates to the International Conference on Electrical Units and Standards which is to assemble in London on the 12th of October.

PERSONAL.

At the meeting of the Bury and District Joint Water Board last Thursday, Mr. J. W. Smith was appointed, out of 134 applicants, Resident Engineer to the Board. The successful candidate is a native of Bury, and commenced his training under Mr. J. Cartwright, the present Engineer to the Board—subsequently becoming his Assistant. Two years ago, he obtained the position of Assistant Water Engineer to the Leeds Corporation.

Last week, Sir Hugh Bell (best known to readers of the "Journal" in connection with his chairmanship of the Tees Valley Water Board), who is severing his connection with the municipal life of Middlesbrough, after serving in numerous offices for nearly forty years, received striking proof of the gratitude of the townspeople for all that he has done; his services being recognized by presenting to the town of Middlesbrough his portrait in oils (painted by Sir Hubert von Herkomer), and the presentation of a replica thereof to Lady Bell, together with a diamond tiara. Sir S. A. Sadler, on being called upon to make the presentations, asked the Mayor to accept for the Corporation the painting of Sir Hugh Bell, and Lady Bell to accept the replica of the portrait, together with the diamond jewels, which would remind her that her husband's splendid life would shine like them in the memory of a grateful people. Both Sir Hugh and Lady Bell returned thanks.

It will be seen, from the report which appears elsewhere of the speech of Mr. Corbet Woodall at the meeting of the Gaslight and Coke Company last Friday, that Mr. A. C. M'Minn, the Superintendent of the Kensal Green station, is leaving the Company after 48 years' service. Mr. M'Minn joined the Gas Institute in 1882, but left it on the formation of the Institution of Gas Engineers. At the first meeting of this body, under the presidency of Mr. G. C. Trewby, in 1891, Mr. M'Minn read a paper on "The Installation of Inclined Retorts and Labour-Saving Appliances in Connection Therewith;" and the members subsequently visited the works at Kensal Green, where they saw the installation described, and were hospitably entertained by the Company. Mr. M'Minn was for a time on the Council of the Institution, and upon the union with the Institute he became a member of the new organization. The name will still be associated with the Company, as Mr. M'Minn, jun., is in their service.

OBITUARY.

The July number of "Het Gas," which is just to hand, reports the death on the 2nd ult., under painful circumstances, of Heer W. van Hoeve, the Manager of the gas-works at Sliedrecht, a Dutch town of some 11,000 inhabitants. It appears that it was found necessary to send four men to work in a small gasholder. After they had been there 20 minutes, Heer van Hoeve came up and saw that they had been overcome. He jumped in, and succeeded in rescuing two of the men, but was then himself overcome, and his son who had arrived was unable to lift him out. More assistance came too late to be of service, and Heer van Hoeve and two workmen lost their lives. Deceased was born in 1855; and before going to Sliedrecht he had charge of the Culemborg Gas-Works.

The Estate of the Late Mr. John Drew.—Mr. John Drew, the Chairman of the Hornsey Gas Company, who died at Torquay on the 24th of May, aged 83, left estate of the gross value of £246,763, of which the net personalty has been sworn at £217,493.

Professor Lewes's Cantor Lectures on "Fuel and its Future."—Our readers will probably remember that in March last Professor Lewes delivered four Cantor Lectures at the Society of Arts on "Fuel and its Future." Full abstracts of them were given in the "Journal" at the time; and they have now been published *in extenso* in the last four numbers of the Society's "Journal."

Illuminating Engineering Society.—The Chairman of the Convention Committee of this Society (Mr. G. Ross Green) has given an indication of the nature of the business to be transacted at the second annual convention, which will be held in the Hotel Walton, Philadelphia, on the 5th and 6th of October. In addition to the address of the President (Dr. Louis Bell), there will be about seventeen papers. Dr. E. P. Hyde, of Washington, will deal with the subject of "An International Unit of Light;" Mr. T. J. Litle, jun., will have a paper on "Modern Gas Lighting Conveniences;" Mr. H. Thurston Owens will discuss "Gas and Electric Street Lighting Fixtures;" Dr. A. H. Elliott will discourse on the "Illuminating Value of Petroleum Oil;" and Dr. F. E. Cady will treat of "The Relation between Candle Power, Voltage, and Watts of Different Types of Incandescent Lamps." Other papers promised are the following: "Architecture and Illumination," by Mr. Emile G. Perrot; "Structural Difficulties in Installation Work," by Mr. Strong; "Intensity of Natural Illumination throughout the Day," by Mr. L. J. Lewinson; "Calculation of Illumination by the Flux-of-Light Method," by Messrs. J. R. Cravath and V. R. Lansingh; "Specific Intensity of Lighting Sources," by Mr. J. E. Woodwell; "Design of Reflectors for Uniform Illumination," by Mr. A. H. Wohlauer; "The Ives Colorimeter in Illuminating Engineering," by Dr. H. B. Ives; "Some Experiments on Reflections from Walls, Ceilings, and Floors," by Messrs. V. R. Lansingh and T. W. Ralph.

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Ludwigshafen	30	Berlin—Oberspree	48
Zürich	100	Berlin—Mariendorf	84
Düsseldorf	70	Berlin—Tegel	10
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Brandenburg a/H.	60	Worms	30
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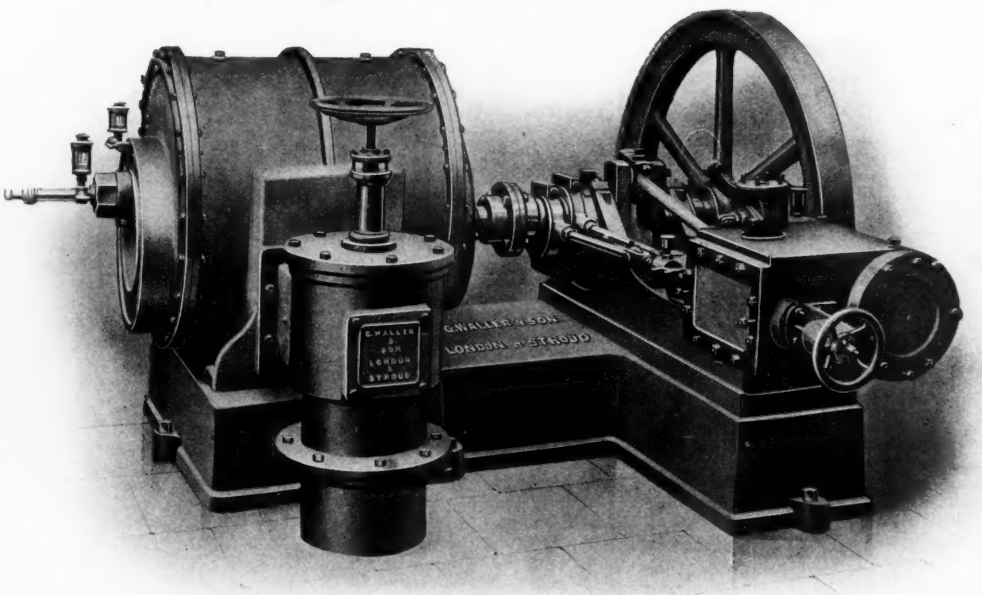

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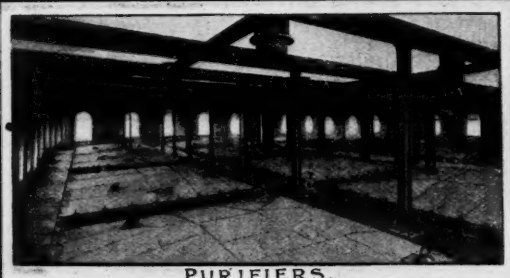

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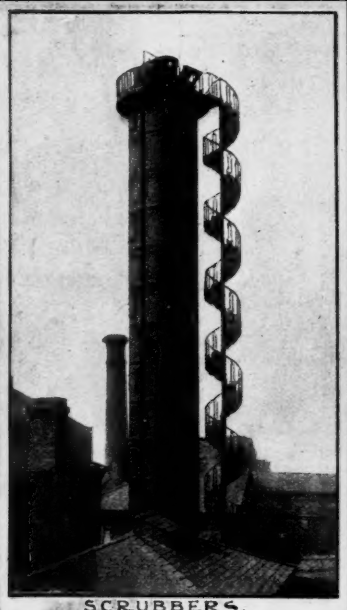

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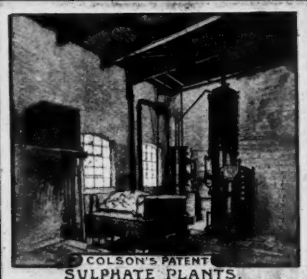

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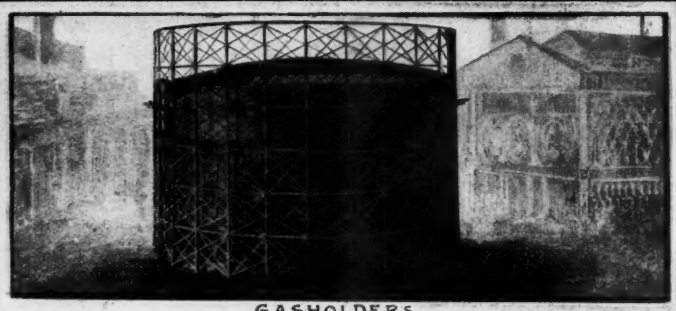

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IRISH ASSOCIATION OF GAS MANAGERS.

ANNUAL GENERAL MEETING AT HOLYWOOD, AUG. 11, 1908.

PRESIDENTIAL ADDRESS

of Mr. THOMAS FRIZELLE, of Holywood.

Gentlemen,—My first duty is to thank you for the honour you have conferred upon me by placing me in the position I occupy here to-day. Twelve years ago (in 1896), I had the privilege of presiding at an annual meeting of the Parent Association; and many changes have taken place since then. On looking up an Association report of that year, I find there were then 46 members on the roll, against a total membership of 117 at the present time; so that I am in a position to genuinely congratulate the Association on its marked progress in numbers and influence during the interval. Of the 46 members, I observe that only 11 remain on the roll at the present time—several having left the country to take up more lucrative and responsible positions in other lands, and some having gone over to the "great majority." In this connection, we have to note, with regret, the death last year of one of our members—Mr. Conroy, of Galway, so well known to many of us as a man of quiet, unassuming character, and one who always took a deep interest in the welfare of the Association.

I am sure every member of the Association will join with me in congratulating Mr. Whimster, our Hon. Secretary, on the honour conferred upon him by the Lord Lieutenant, in appointing him to the position of Justice of the Peace for the County of Armagh. No one more worthy could receive the honour; and we hope it is the first step to higher honour in the near future.

In regard to the position occupied by our Association and by the gas industry in Ireland generally, I would just observe, in passing, that this is essentially the country of small gas-works. Leaving out the important centres of Dublin, Cork, and Belfast, I find that while there are 107 gas-works in the remainder of Ireland, 90 per cent. of them manufacture less than 30 million cubic feet of gas per annum, 42 per cent. of them make less than 5 millions, while in 28 per cent. the production is something less than 3 millions. It follows, therefore, that the membership of our Association must necessarily be largely made up of managers of the smaller type of gas-works—men more interested in the daily worries and difficulties encountered in such works than in any large question affecting stoking machinery, coal-elevators, coke-conveyors, or the like. I would venture to remind the members, however, that the troubles arising in small works are, to a great extent, identical with those encountered in the large ones—the question being in many cases merely one of degree; and I have often thought that if the smaller managers joined more freely in the discussion of matters of such practical interest to all as may come up from time to time, or if each were to communicate his views and experience as to the best methods by which to overcome such matters, for instance, as stopped ascension-pipes, pitched mains, naphthalene troubles, &c., the result could not fail to be profitable to the members generally. There was a time, not so far distant, when each gas manager kept his own counsel, and would not communicate with a neighbour in distress. But that time is gone; and since its departure the gas industry has prospered in every direction. Nothing has tended more to dispel this narrow, isolated way of working than Association meetings such as this, where each member is free to give his experience, or criticize the different subjects brought forward for discussion; and a spirit of healthy rivalry is produced. Like players in a game, each does his utmost to come out best; so each manager does, or should, endeavour to show results equal to, or even better than, his neighbour, even though he happens to be a big neighbour.

While there is little excuse for any manager at the present time being ignorant of the most up-to-date methods of manufacture and distribution, seeing the number and excellence of technical books, and the papers and discussions which are published weekly in the Technical Press, I should like to direct attention to the fact that more is necessary to the making of a successful gas manager than mechanical training, drawing, and chemistry. One requires to know, for instance, how and when to buy and sell to the best advantage; but one especially needs to understand how to deal with consumers. Indeed, a gas manager should be all that is summed up in that comprehensive term, "a good business man." Few come so frequently into contact with members of the general public, when these are in what may be described as a "doubtful" humour, as the manager of a small gas-works; and great wisdom and tact are necessary if good relations are to be maintained, and general confidence won and kept. More, too, than mere business aptitude, or rather, indeed, as springing therefrom, one needs to be imbued with the spirit of progress—that "spark of fire," as it has well been called, which is one of the greatest assets a man can have, and which must never be allowed to die out. The progressive manager naturally enjoys hard work—work calling for resource, skill, and initiative. He is not afraid to take up new responsibilities, if only they may promise success; and the satisfaction derived from accomplishing something—of seeing results for the labour expended—is not only reward in itself, but incentive to further effort. It should likewise be borne in mind that, in this matter of progress, every step forward not only serves the manager concerned and his immediate neighbourhood, but that any improvement rendering the use of gas more popular is speedily known in places far apart; for in these days of rapid and ready transit and frequent intercommunication, the news of anything affecting the convenience and comfort of life travels far and fast, so that the influence for good exercised on the industry generally by the progressive manager is much more extensive than might at first be supposed. Moreover, the success achieved by one manager in this direction naturally stirs up another to emulate his example, and either carry an improvement farther still, or seek out useful developments in other directions. I may, perhaps, say that I have personally proved the truth of this more than once in my career.

In viewing the events of the past twelve years, it is, I think, not far short of marvellous to find that the small works in Ireland have held their position so well during the interval, in face of opposition from so many rival illuminants. Oil gas, acetylene gas, and petrol gas, not to mention our old opponents petroleum and electricity, have all had to be encountered in greater or less degree; and yet we find the little gas-works throughout this country not only holding their own, but increasing their sales by more than 50 per cent., and this notwithstanding the general adoption of incandescent gas lighting. In view of the latter fact, and its necessary accompaniment of reduction in consumption with increased illuminating power to our customers, it may well be asked how the addition of 50 per cent. to the quantity of gas actually sold to the public in the period referred to has been brought about. The following facts will satisfactorily explain the matter, and afford, I think, a sufficient commentary on the forebodings of our friends and the confident assurance of our opponents that the age of gas was speedily passing away. In the 107 works referred to above, I find the number of consumers has increased from 23,580 in the year 1898 to 41,898 in the year 1908—an increase of 77½ per cent.; the number of prepayment meters, from 1196 to 10,777 (801 per cent.); and the number of cooking-stoves, from 1686 to 9249 (448½ per cent.). All this shows a fair rate of progress, when it is remembered that the population in the majority of towns in the south and west of Ireland has decreased considerably during the period referred to. It certainly proves, at least to my mind, that the gas managers of Ireland have not been sitting idle. Far be it from me to underrate the value of fair competition in any business; it usually brings out the best that is in a man—puts him on his mettle, as it were. In this way new ideas are often conceived, and improved methods devised, that may change the whole system of working for the better, and prove eminently beneficial to the community. This seems especially exemplified in the progress made by the gas industry during recent years, when, by the addition of improvement to improvement, its utility, and its innate adaptability to the needs of the time, it has successfully demonstrated its superiority over every other much-belauded rival; so that to-day we find it more extensively used, and more secure in public favour than before.

With what a flourish of trumpets our electrical friends announced the success of the new metallic filament lamps. At last the poor man was to have electric light as cheap as gas. But, tested by independent authorities, these lamps are found to be far from being as cheap as incandescent gaslight. It now appears that they possess inherent defects which militate against their general adoption. For instance, the filaments of some are so fragile that they have to be suspended perpendicularly on anti-vibrators; while some authorities doubt if any but a limited number can in any event survive the perils of transit and fixing. I invite the attention of the Association to the following remarks on the subject of the comparative cost of illumination by these new lamps and by incandescent gas respectively, taken from an able paper prepared for the Wales and Monmouthshire District Institution of Gas Engineers by Mr. J. H. Canning, of Newport, entitled "Some Notes on New Electric Lamps."* He says:

Allowing the very high efficiency of 1·3 watts per candle power, current at 3½d. per unit (which is less than the average charged over the whole kingdom) and a life of 600 hours, the following comparison of the cost of two 32-candle power osram lamps and of an incandescent gaslight of equal power over a year of 1800 hours will show that there is no ground for supposing that our industry will fail for a moment in maintaining its premier position:—

Electricity.

	£	s.	d.
Two osram 32-c.p. lamps at 1·3 watts per c.p. for 1800 hours—energy consumed (say) 149 units, at 3½d.	£2	3	5½
Renewals, six lamps, at 4s. each	1	4	0
Total	£3	7	5½

Gas.

	£	s.	d.
One 64-c.p. incandescent gas-burner, consuming (say) 4 cubic feet per hour for 1800 hours=7200 cubic feet, at 3s.	£1	1	7½
Renewals, three mantles, at 4½d. each	0	1	1½
Total	£1	2	9

This shows that, . . for equal amounts of light, incandescent gas is only one-third the cost of the most efficient of the metallic filament lamps.

Mr. Canning has rather understated the case for gas, seeing that he gives incandescent gas credit for only 16-candle power per cubic foot, whereas more than 20-candle power is easily obtained.

* See "JOURNAL," Vol. XCIX., p. 697.

According to the photometrical tests made by Mr. Herring, of Edinburgh, in May last,* at the Scottish National Exhibition, Edinburgh, the "Vesta-Graetzin" 3-light inverted gas-lamp, regulated to a consumption of 10·6 cubic feet per hour at 30-10ths pressure, gives a total of 396 candles, or 37·4 candles per cubic foot of gas consumed. Then, again, the "Stanley" inverted lamp, tested on the same occasion, the pressure being regulated to 25-10ths, gave 338 candles, with a consumption of 8·3 cubic feet of gas per hour—being 40·7 candles per cubic foot consumed. These are low-pressure burners. But the surprise of the season is certainly the invention of Messrs. Keith and Blackman. Their new high-power inverted one-mantle lamp, for either indoor or outside lighting, with a consumption of 2 cubic feet per hour, produces a light of 60 candles per cubic foot, or 120 candles for the 2 cubic feet consumed; and their large lamp, with a consumption of 22·9 cubic feet, will actually afford a total illuminating power of 1685 candles, or 73·6 candles per cubic foot of Edinburgh gas consumed. It would seem, therefore, that electricity has still some leeway to make up before gas can be extinguished.

It is often the case that our electrical friends, when they can find a town council to listen to their story, endeavour to show that there is but little difference between the cost of electricity and gas for lighting purposes; and they enlarge on the great advantage and saving effected in being able to switch on and off the electric light at will. It occasionally happens that members of a town council, without thorough and impartial investigation, plunge their town into the cost of an expensive electrical plant which cannot be made to pay its way, so that from year to year the inhabitants are saddled with an increase of rates to make good the ever-recurrent loss. In view of such cases, I think it is but fair to the public that the striking results shown in these tests of the latest improvements in incandescent gas lighting should be known—proving conclusively, as they do, the vast superiority of gas over its nearest rival, from an economical point of view.

Among the notable inventions in the lighting department which have been brought to our notice during the past few years, not the least are the different systems of automatic lighting and extinguishing—of switching on and off gaslights in private installations as well as in public lighting. Among the former we have the "Norwich" switch, the "Pneumatic" switch, and the "Telephos" system—the last-named working without a pilot-light. For public distance lighting we have the different automatic controllers, wound up weekly or fortnightly, some working with a pilot-light, and others (the "Zula," for instance) ignited by an electric spark. The "Gunning" and "Horstmann" apparatus, automatically adjusting the time of lighting to the seasons, have also appeared. Other appliances for distance lighting are those actuated by a wave of pressure, such as Alder and Mackay's patent. These different systems are being adopted in many parts of Britain and on the Continent, and are a healthy indication of the progress that is being made in meeting the demands of public utility.

On the manufacturing side of our industry, too, matters have not been allowed to lie dormant. Much more attention is given to the advantages gained by the adoption of level dips and shallow seals in the hydraulic main, and by the retort-house governor and the tar-column. Mr. Paternoster's lucid paper to the Eastern Counties Association, on the increased make of gas per ton of coal obtained by the alterations he made in these directions,† should inspire the manager of every small works at least to follow him up in the same line. In the march of events, we are having all the old ideas of carbonizing exploded. Instead of the small charge quickly carbonized, we are told to fill up the retorts, and give them seven or eight hours to work off, and we shall have a higher yield of gas per ton of coal, gas of higher calorific value, and better coke—all great advantages. Let us look even farther afield, however, to those latest systems of carbonizing which are on the way—first, perhaps, the vertical retort. We are told by the patentees that 12,000 or 13,000 cubic feet of gas per ton of coal can be obtained; that the gas is of better quality; that stopped ascension pipes, pitched mains, and naphthalene troubles are to be things of the past; that we shall have more ammonia, less sulphur, and better tar; that the day of the trained stoker is gone; and that either continuous or intermittent charging may be carried on at will. Then, again, there are "Love's Forty-Fives," as they are called, filled up from a hopper, and allowed from eight to ten hours to work off. Almost the same results are claimed for this system as for verticals. But either system must be regarded as a great improvement on the old horizontal settings in labour-saving alone—indeed, they appear to me to be ideal systems of carbonizing.

In contrasting the returns of large works with small ones, there is one problem which has exercised my mind not a little for some time past. It is this: Why are the results obtained in the small gas-works not always equal to those obtained in the large? Elevators and stoking machinery do not wholly explain the difference, for there is some truth in the oft-quoted saying, "An active man with a barrow and shovel is hard to beat." Moreover, most of us have generator or regenerative retort-settings, and can, at little expense, make the necessary alterations to our carbonizing plant so as to get all that is possible out of the coal we carbonize. For my part, I think that if all our small works were run constantly on the lines of "test works," the difference in results to which I allude would very largely disappear. All coal could be weighed before being put into the retorts, for instance, and a correct record kept daily of the make of gas and coke per ton of coal carbonized, so that one might see the quantities per ton obtained. In this way, carelessness or irregularities could be immediately detected and set right. I am afraid we imitate the larger works too closely in such matters as waiting until a cargo of coal is finished, or until the end of the financial year, before making up the yield from the coal. I am also of opinion that we managers of small works should lead the larger works in results. We can have all points under personal observation and control. Cause and effect should be intimately known to us; and, as Mr. Helps stated recently, in his interesting talk to the London and Southern Junior Association, a valuable habit of observation would thus be formed, so that nothing should escape us and nothing be lost.

Since you have done me the honour of coming here to-day, some details with reference to the Holywood Gas-Works may perhaps be of interest. The population of Holywood, according to the last census, was 3840; but, taking the whole district supplied by the Gas Company, it is estimated at 5000. For a good number of years prior to 1897, the make of gas remained stationary—between 7 and 8 million cubic feet per annum. The price was 5s. per 1000 cubic feet in the town and 5s. 10d. outside. During the year 1897, a forward movement was begun; the price of gas being reduced by 10d. per 1000 cubic feet—*i.e.*, to 4s. 2d. and 5s. respectively—in the districts before mentioned. An exhibition of gas appliances, on the usual lines, was also held, and cookery lectures delivered; these being followed up by advertising and canvassing. The result was that by the end of the year 45 cooking-stoves were hired or sold, in addition to many hot-plates and fires; and the make of gas rose to 9,294,000 cubic feet. The following year, the price of gas was further reduced in the outer district by 10d., making a uniform charge of 4s. 2d. per 1000 cubic feet to all consumers; and the make increased to 11,461,000 cubic feet. Up to this time, the local plumbers did all the fitting of cookers, &c. But the results generally were unsatisfactory to both the consumer and the Gas Company; and my Directors decided to employ gas-fitters of their own. These men were set to instruct the consumers in the most economical methods of using gas, and every opportunity was taken to educate the public, and to convince them of the convenience and advantages to be derived from the use of gas for domestic purposes. To these methods we added canvassing and advertising by means of posters, handbills, and booklets. This course was persistently followed until the year 1905, by which time, the output of gas amounting to 20,494,700 cubic feet, the price was still further reduced to 3s. 9d. to ordinary and prepayment consumers alike. During the past year, the quantity of gas sent out reached 24 million cubic feet. There are upwards of 300 cooking-stoves in use; while the number of laundry-irons, boiling-burners, fires, &c., employed in addition to these is not known. Artisan cookers and boiling-burners we fit free, on certain conditions, to tenants occupying houses of less than £10 valuation.

I should like to point out that, for the purpose of increasing the consumption of gas, an occasional spurt, such as an exhibition of cookers every four or five years, is of but little use. A continuous keeping in touch with the population of the district is essential; and a supply of the best and most economical gas appliances should be always kept before their notice. I find also that every new consumer gained and satisfied with the change to gas from another illuminant, acts as an advertisement in his neighbourhood, and usually gains others.

Owing to the increased output of gas, my Directors were obliged to remodel, and increase the capacity of, the works, with the exception of the gasholders, condensers, and station meter, which are found sufficient for the present. The retort-house now contains 28 retorts—viz., four beds of sixes and one bed of fours. The four beds of sixes were built by Drakes Limited, on their well-known shallow tubular regenerative system, with subways 4 ft. 6 in. deep. The retorts are 22 in. by 16 in. by 8 ft. 9 in. inside measurement, and have Drakes' eccentric self-sealing mouthpieces. The bed of fours was built by Steel, of Athlone. Owing to the presence of water just under the floor level, it may be interesting to state that, in order to adopt regenerative firing, the roof of the retort-house was raised 4 ft. 6 in., and the floor level raised accordingly. The retort-benches were built inside a concrete envelope, as the works are subject to flooding through high tides in stormy weather. Sump-holes were also sunk, and a pump was placed in the engine-room so as to keep all surplus water below the level of the subways. The hydraulic main is in sections, one to each bed, with separate gas and tar valves. The tar is taken off by a duct from the bottom of each section of this main, so that the dip-pipes may be sealed in water. The hydraulic main and the foul main rest on steel joists, supported by the front and back buckstays. Each section is provided with a 3-inch flush-out pipe; and a smaller pipe supplies the main with ammoniacal liquor. The cast-iron foul main is 10 inches in diameter, and is carried along the gable end and side wall of the retort-house to the condensers, which are of the ordinary type, and consist of 24 eight-inch pipes, 20 feet high, with the usual seal-box at the base.

The exhausters, two in number, each capable of dealing with 10,000 cubic feet of gas per hour, are of the rotary type: one (a two-blade) by the Bryan Donkin Company, and the other (a three-blade) by Messrs. G. Waller and Son. The scrubber-washer is by Messrs. W. C. Holmes and Co., of Huddersfield, and can deal with 200,000 cubic feet of gas per day. There is also a "Standard"

* See "JOURNAL," Vol. CII., p. 358. † *Ibid*, Vol. CII., p. 290.

washer, which is used as a tar-extractor, &c. All the machinery is rotated from a countershaft driven by an "N" type Crossley gas-engine; a smaller engine being available for use in cases of emergency. The purifiers, four in number, are 11 ft. by 8 ft. 6 in., and 5 ft. deep, with Walker's centre-valve, and are worked three on and one off. Oxide and lime are used during the winter, and oxide alone in the summer months. Owing to the nature of the subsoil, already referred to, these purifiers are placed on a cement concrete foundation at the yard level. They therefore stand 5 feet high; and a wooden platform is erected around them, so that the purifying material may be wheeled in and out with ease, and the spent lime discharged into carts drawn alongside. The sulphate plant is a three-ton per week continuous plant, of the single-still type, by Messrs. R. & J. Dempster, Limited, of Manchester. There is also a Maxim patent carburettor, used during the spring and autumn months, which assists in dissolving naphthalene; but we purpose changing the system of working at an early date.

The quantity of coal carbonized during the past year was 2149 tons. The maximum make last winter was more than 116,000 cubic feet per day; and the number of retorts in work was 16. Six-hour charges and nearly 3½ cwt. of coal to each retort is the usual work. The make of gas per ton of coal during last year averaged 11,166 cubic feet; and the sale per ton, including the gas used in the works, was 10,432 cubic feet. The coke and breeze sold per ton of coal, not including that used for the boiler, amounted to 10 cwt.; and the quantity of tar sold per ton was 10½ gallons. Owing to an underground leak in the ammoniacal liquor pipe, which was not discovered for a considerable time, the make of sulphate was greatly reduced; but the maximum make per ton of coal has reached 24½ lbs. The capital has been reduced from £1352 to £450 8s. 4d. per million.

If we may claim a share of success in the past, I venture to say it has been attained, in great measure, by prompt attention to little things as they arose inside the works and throughout the district; and if there is one lesson more than another that has been impressed upon me by years of experience it is this—that close attention to detail is essential to success; for in matters of business, as in other aspects of life, it is, after all, "the little things that count."

CANADIAN GAS ASSOCIATION.

In the "JOURNAL" for the 21st ult., we recorded briefly the proceedings at the First Annual Meeting of the above-named Association, which was held in the King Edward Hotel, Toronto, on the 26th and 27th of June, under the presidency of Mr. H. H. POWELL, of Brantford. Concurrently with the formation of the Association, there was started a publication entitled the "Gas Journal of Canada," which has been constituted the "official medium" of the new organization. It will be devoted to gas used for light, heat, and power, and will be issued monthly. The first number contains the President's Address and some of the papers read at the meeting; and we are therefore now in a position to deal more fully with the proceedings.

After the preliminary business had been disposed of, the President delivered a short address. At the outset he said it was rather difficult for him to speak to a meeting composed of men skilled in every branch of the manufacture and sale of gas, its residual products, and the appliances used in its consumption. However, he bore in mind the fact that they were assembled in the interest of the gas business of Canada, hoping, through the medium of the Association, to have an exchange of experiences and suggestions relating to the advancement of the processes of manufacturing and selling their products and the protection of their interests. They wished to get the Government, if possible, to give them the same opportunities as other manufacturers and merchants had to carry on their business under the law. Association work was necessarily largely carried on through Committees who took up special subjects. They had had under consideration the advisability of establishing a plant or plants for working up residual products; and it had had the effect of a company being formed and the construction commenced of plant that would combine the most recent appliances with the most modern practice of large-scale operations—one that could hold its own against all-comers as a result of scientific efficiency, supported and controlled by gas interests, so that they would no longer be at the mercy of combines who paid next to nothing for residuals. This marked a decided advance in the business. To the reports presented by the Committees, and to the papers to be read, he trusted the fullest consideration would be given; and it was hoped that the members would feel it to be their duty to contribute any information that had proved profitable to them in connection with their duties.

After these introductory remarks, the President proceeded to make a few suggestions. He said he thought the Association should endeavour to get the Government to change the standard test of gas from candle to calorific power. Gas suppliers could then give the consumers the same number of heat units they now had, and get a very much larger yield of gas as well as of bye-products per ton. "Across the water" they were getting as much as 13,000 cubic feet of 600 B.Th.U. gas per ton. Why should they continue the candle power test? It was their duty to educate the Government and the people as to the standard under which the greatest value could be given for their money. They must be progressive, or they would again become a "threatened industry." Welsbach proved a wonderful help in time of need. But he and others were helping their electrical friends in the same way; so that the advantage gas men had was growing less. If they wanted to hold the lighting business, they must do as France and Germany were doing in regard to the use of alcohol with incandescent mantles. In order to get it to light direct with a match, they were stimulating invention by offering a prize of $20,000. Let gas men give a good prize for a mantle that would not require a match, and they would get it; and they would not only keep the lighting business, but get a great deal more of it, when every mantle made was a self-lighter.

Desirable as was the lighting business, continued the President, much more so was that connected with domestic heating and industrial uses. This was the great field. It meant charging low prices to get it, as they had to compete with free anthracite coal, free coke, and Government bounty-fed oil and exploited water power electricity—truly a formidable list (particularly when they had to pay 53 c. a ton duty on their coal), to which must be added free alcohol, which was being made for 10 c. per gallon, and, pound for pound, contained twice the lighting power of kerosene. These were their competitors; and they had to beat them to get business. In this connection, he would suggest that they should consider what might be accomplished by changing their methods of selling gas. Could they not adopt one that would induce their patrons to be liberal consumers, that would change the large number of non-profitable into profitable ones, and good customers into better ones? Why could they not adopt the system of making a minimum monthly charge on the basis of "readiness-to-serve cost," *plus* a minimum amount of gas at regular rates, then drop the price per 1000 cubic feet to that which represented the profit required based on the cost in the holder, because all other charges were included in the "readiness-to-serve charge." The water companies made a minimum charge for the first tap; with the succeeding ones priced much lower, and with meter-rates ranging from 25 c. down to 5 c. per 1000 gallons. The electricity companies did the same. They varied their prices from 10 c. to 0·25 c. per kilowatt, according to quantity. Why should not gas men do likewise? Let them base their profits on the cost of gas into the holder, and demonstrate that gas could compete with other fuels. Then the sales would go up and the cost of distribution down, and they would have in every appliance manufacturer and every salesman a hearty co-operator, who would help them to get more business.

The President concluded by congratulating the members on the satisfactory organization of the first annual meeting of the Association, the Executive Committee on the large amount of work they had done, and the Secretary-Treasurer (Mr. A. W. Moore) on the result of his efforts to make the Association a success.

Mr. J. C. Hay (the President-Elect) then offered a few remarks on short weight in coal. The Executive Committee of the Association have been collecting statistics which show that, having paid freight and duty on the coal used in gas making, the buyers lose at least $5 a car in short weight. The matter has been laid before the Railway Commission, and it is confidently expected that some measure of relief will be granted. It is recognized that the Commission have no power beyond the boundary line; but the Committee think the Commission might make an order that all coal coming into Canada should be weighed at that point by an independent weigher, just as is done in the case of grain, and that it should be bought subject to the Government weight. The matter is to be brought again before the Commission.

The meeting adopted the constitution and bye-laws of the Association as prepared by the Executive Committee.

An indication has already been given of the nature of the technical subjects brought before the members; and one of the papers, on the subject of the use of Canadian coal for gas making.

Proposed Calorific Power Test for Gas in Chicago.

We learn from a correspondent that the Municipal Council of Chicago have been considering the advisability of introducing a new ordinance under which daily tests will be made of the heating power of the gas supplied to the city. The discussion opened with a demand by one of the aldermen that the gas should be tested every day instead of intermittently, on the present photometric basis. The matter was referred to the Lighting Committee, and an investigation into the whole question was begun; all the different ways of testing gas being fully considered. It was found that a satisfactory test for illuminating power does not necessarily mean that the gas is suited for use with the various mantles now employed in incandescent gas lighting. Should the proposed new test be introduced, it is believed that the present photometric test will be discontinued as being superfluous. The city is rather peculiarly situated in regard to its gas supply; several of the Companies having amalgamated last year. The Ogden Gas Company have an annual output of about 1100 million cubic feet of gas, all made in Lowe double-superheater water-gas plants. It is nominally of 26-candle power; and they charge 85 c. (3s. 6½d.) net per 1000 cubic feet. The Peoples Gas-light Company have a very much larger undertaking—their mains extending to 2311 miles, against 77 miles in the other case; and they, too, make only carburetted water gas. As changes are pending, it is thought probable that some decision will be come to on the subject of uniform pressure.

EXPERIENCES WITH CANADIAN COAL.

By R. A. Wallace, of Quebec.

[A Paper read before the Canadian Gas Association.]

Prior to 1906, when control of the Quebec Gas Company changed hands, the manufacture of gas had been carried on in somewhat out-of-date works, which, while they may have served the purpose at the time, were not calculated to meet the demand of a growing business, or secure the most economical results.

Canadian coal, the analysis of which showed the presence of a large percentage of sulphur, had been used almost entirely; the carbonizing being carried out in direct-fired benches at low heats, while lime alone had been employed for purification, in a set of four boxes, 12 ft. by 14 ft. by 4 ft., controlled by a centre-valve permitting three boxes on and one off at all times. As far as I could ascertain, stopped ascension-pipes or naphthalene obstructions were things unknown; but preparing the lime and changing the purifiers required a large amount of labour.

The new owners having decided on the immediate installation of up-to-date plant, with much greater capacity, such repairs were made to the old apparatus as would enable us to get along with an increasing output for a few months; it being expected that the completion of the new appliances would put us in a more comfortable position for some time.

The sections of the new plant were designed to have a nominal capacity of 700,000 cubic feet of gas per day; the purifiers (four in number) being 20 feet square and 5 feet deep, with 16 inch connections, and a valve system which permits one, two, three, or four boxes to be used as desired—the boxes being arranged in series. The retort-house section was completed first; and, with visions of higher yields and reduction of operating expenses, the regenerative benches were put into commission. But then our troubles began.

With the higher heats in the new benches, the quantity of sulphur compounds thrown forward increased to such an extent, that, do what we would, the old purifiers could not deal with the gas passed. The quantity of lime on the grids was increased, and changes were made in the mode of preparation; but all to no purpose. Complaints from consumers kept coming in. The first of the new boxes was rushed to completion—temporary connection being made to the outlet of the old purifiers—and the extra box charged with two 18-inch layers of fresh oxide of iron; but with little improvement. As the acetate of lead test-paper showed clean gas at the outlet of the old boxes, every precaution was taken to make sure that no gas was bye-passing the purifiers; and preparations were made to have a second new box put into commission as quickly as possible.

In the meantime, we were also having serious trouble in the retort-house with stopped ascension-pipes and pitch in the hydraulic mains, and difficulty in having the tar flow freely from the hydraulic mains to the well. As the tar-main to the well was exposed for a short distance through an open shed, and the outside temperature was ranging from 28° to 35° below zero, we had it covered with hair-felt, and a jet of steam turned in to keep the tar warmer; the hydraulic mains were cleaned out thoroughly; and the heats in the benches reduced.

The second of the new purifiers was turned on, being charged with a 9-inch layer of lime and two 18-inch layers of oxide. But, while there was a decided improvement, the conditions were still unsatisfactory. As we had been changing the old boxes very frequently, and there had been no evidence of sulphuretted hydrogen passing the purifiers, it occurred to me that the lime had not become sufficiently foul to arrest the carbon bisulphide, and the old boxes were allowed to remain unchanged for a longer period. But it was not until we had turned on the third of the new boxes, which was charged with two layers of lime and one of oxide, that the complaints from the consumers ceased.

We now had a total of six boxes at work; three of the old ones, all charged with lime, and the new boxes containing lime and oxide, as already mentioned—the oxide being mixed with about 30 per cent. of planer chips to lighten it. While the complaints from outside ceased with the introduction of the sixth box, the changes in the purifiers necessary to maintain this condition were too frequent.

Believing the trouble to be in the coal itself, we started using coal from another shed, and made arrangements to have a sample of what we had been using tested in an experimental plant. With the change in the coal, the conditions improved at once. The experimental test of the coal showed the following results:—

	Per Cent.
Volatile matter	25·00
Fixed carbon	69·00
Ash	4·40
Moisture	1·60
Total	100·00

An analysis of the crude gas resulted in showing the presence of 11 per cent. of carbon dioxide, and 1640 grains of sulphuretted hydrogen and 75 grains of bisulphide of carbon in 100 cubic feet. A test of the oxide which had been in use in the boxes up to this time indicated 12 per cent. of free sulphur.

Our experience has demonstrated that, under certain conditions, the purification of gas from coal containing such large quantities of sulphur will be a most difficult and expensive operation; and to maintain a satisfactory relation between maximum yield and minimum cost we must be satisfied with results per ton, or make per bench, much below those usually obtained from coals mined in other localities. With higher heats such as are in everyday practice employed to carbonize Pennsylvania and some other coals, the sulphur compounds other than sulphuretted hydrogen would be so much in excess from Nova Scotia coal as to make ordinary methods of purification expensive or unsatisfactory, while to attempt to purify the gas with oxide alone would be altogether useless.

If the coal is stored outside, and allowed to become wet, the amount of carbon dioxide in the crude gas will be very much increased, and necessitate a greater quantity of lime and more frequent changes in the purifiers to secure satisfactory service and freedom from complaints. We have since decided that wet coal was the principal cause of our first trouble; the carbon dioxide evidently passing into the second and third boxes, and driving forward the sulphur which had already been absorbed—an immediate improvement having followed the change to dry coal.

The best conditions are secured by maintaining a moderate heat in the benches, by taking precautions to keep the coal dry, and by maintaining such a seal on the dip-pipes as will ensure against drawing-in air without throwing an excess of back-pressure on the retorts. The admission of atmospheric air will not only upset the purification in the carbonate and sulphide boxes by driving forward the sulphur compounds, but will also set up partial revivification in the oxide of iron, and bring about such an increase of temperature within the purifier as will set up a very considerable element of danger from fire the instant the cover is raised for the purpose of removing the fouled material.

The usual lead-paper test applied near the outlet of the boxes is no indication that the gas is passing clean into the holders, as the impurities other than sulphuretted hydrogen will be carried forward while the lead-paper indicates a clean box, and will quickly manifest their presence where gas is being consumed.

To secure freedom from complaints, care must be taken to arrest the carbon dioxide in the first lime-box, at the outlet of which tests should be applied to determine whether or not this is passing in any quantity into the box for the arrest of bisulphide of carbon. The Orsat apparatus is a satisfactory instrument for making this test.

The following figures relate to the period referred to in this paper:—

Coal carbonized	1784 short tons.
Gas made	14,898,000 cubic feet.
Lime used	80,000 lbs.
Number of boxes changed	12.
Gas made between changes	1,241,500 cubic feet.
Oxide in use	40 tons, exposed thrice.
Average yield per pound of coal	4173 cubic feet.
Lime used per 1000 feet of gas	5·38 lbs.

Where the use of lime and oxide is imperative, it is advisable to have separate purifiers for each, as the different materials do not become foul at the same time. This necessitates increased labour costs in the removal of material which in a separate purifier would have acted on a much greater quantity of gas. At least six boxes should be in use where combination purification is carried on.

I might add that at no time during the trouble with the purification was there any difficulty in maintaining a high illuminating power in the gas; the average for the period being 18·39 candles without any enricher.

Companies Registered and Wound-Up Last Year.—The annual report of the Comptroller of the Companies Department on the matters within the Companies Acts, 1862 to 1900, for the year ended Dec. 31 last, has been published. It appears from the returns of the Registrar of Joint-Stock Companies that the number of new companies registered in England and Wales during the year under review was as follows: Total number of new companies, 4810, from which should be deducted 1795 companies which have gone into liquidation, and 1965 removed from the register under the provisions of the Companies Acts, 1880 and 1900—together, 3760—showing a net increase of 1050.

Limited Companies and the Public.—The "Law Journal" recently contained the following remarks on this subject: "The provisions of the new Companies Act, which came into effect on July 1, impose a number of new obligations on the directors and officers of all companies which had not before that date brought themselves, by the necessary alterations in their Articles, within the category of 'private companies.' There is an increasing vigilance on the part of the Board of Trade and the Registrar of Joint-Stock Companies in keeping secretaries and other officials up to the mark in the observance of regulations and the rendering of returns which will become far more onerous and searching under the new Act. The number of prosecutions for defaults, which five years ago was only 18, rose in the last annual return to 38; and there is further evidence of growing stringency on the part of the authorities in the increase of removals from the register of improperly constituted or moribund companies. This increased official watchfulness and activity in looking after what are generally regarded as public interests should tend to check the operations of the public informer who thrives on the technical defaults of legitimate joint-stock enterprises, and also to the discouragement of proceedings by the private shareholder with some personal grudge or grievance."

THE COMMERCIAL VALUATION OF LIME AND OXIDE OF IRON.

By H. Leicester Greville, F.I.C., F.C.S., &c.

With the abrogation of restrictions over sulphur compounds, the use of lime as a purifying agent has become a limited quantity. The larger gas companies have discontinued its use altogether, allowing the carbon dioxide to increase the volume of gas made; and with the modern methods of testing for illuminating power, this can be done without incurring a penalty. With some of the smaller gas companies, lime is still employed as a purifying agent. In any case, the question of the valuation of lime is of interest; for if not as a matter of purification, there are minor questions in which methods of valuation are of interest.

The use of lime may not be, and is not, for gas purification only, but for mortars, for agricultural purposes, for sewage purification, &c. In all cases the main question is the proportion of free lime. By the older methods of analysis, this involved a rather complicated process. The total lime was estimated by solution in hydrochloric acid, and precipitation by sulphuric acid and alcohol, and weighing as $CaSO_4$. Then the sample was treated with excess of hydrochloric acid in a distillation flask, and the carbon dioxide evolved was received into dilute ammonia. Subsequently, the distillate was heated with a solution of barium chloride, the barium carbonate collected on a filter paper, washed, and then weighed. The barium carbonate calculated into calcium carbonate, gave a basis of deduction from the total lime in which the proportion of free lime could be calculated.

There are many errors involved in this system of analyses, which, in the adoption of more modern methods, it is needless to refer to. The question is a simple process for the estimation of the proportion of free lime in any sample without any unreasonable complication in the analysis. This has been accomplished by the so-called sugar process. This is based on the fact that free lime is far more soluble in sugar and water than in water only. The same condition applies to glycerine; but tests on this material are not in evidence. I recommended the sugar method in my little booklet some years back; but since then the process has been further developed. Of course, the main idea of the method of analysis is simple—viz., that if you can bring the whole amount of the free lime into solution, leaving behind all carbonate and siliceous matters, and estimate the lime in solution by a modified process of titration by acid, you reach the *crux* of the whole question at once, without needless complications.

The latest development of the method was published some time back in the "Transactions of the Society of Public Analysts," by James Hendrick, B.Sc., F.I.C. Omitting minor details, the eventual method adopted was as follows: It was found that the addition of alcohol was necessary to prevent the formation of an insoluble compound of lime and sugar. "In a 500 c.c. flask is placed 10 c.c. of alcohol. Five grams of the powdered lime are rapidly weighed and added. The flask is filled to the mark with 10 per cent. sugar solution, and at once placed on the shaker and shaken for at least four hours. A portion is then rapidly filtered into a 100 c.c. flask, and titrated with standard hydrochloric acid, using methyl orange as the indicator. When the residue readily settles clear, after the shaking, as is often the case, the solution can be poured off directly into the 100 c.c. flask." The author finds that the direct solution of lime in acid and titration gives higher results than the sugar method. This is my own experience. The lower the class of lime the greater the discrepancy, owing to the increased proportion of lime in combination as silicates.

With regard to the question of oxides for gas purification purposes, there has been no modified process of analysis proposed. There are two methods of valuation as to the proportion of Fe_2O_3 present. The one is the gravimetric precipitation; the other is the volumetric, by standard solutions. Of the two, perhaps the latter is the more accurate, but not in all cases. In a long experience of oxides, especially Continental ones, I have had some curious experiences, although I have had very few disputes. I can only remember two in which there was trouble. In one case the opposing analyst raised the question that there was a small proportion of manganese in the sample reported as oxide of iron. Both oxides take up sulphuretted hydrogen; and the equivalents are not widely different. The other case which occurred was one in which it was alleged that a sample in which I reported so much per cent. of "ferric oxide" contained a certain percentage of "ferrous oxide." My reply to this was simply: (1) That there would be little difference on the analysis; (2) that, after the first time of using, the ferrous would pass into the ferric form, and that in all cases the material would be useful for gas purification.

With regard to natural oxides, by which I mean those usually described as bog ores, too much trouble cannot be given to the question of sampling, either by the vendor on sending the sample or by the analyst on its receipt. Further, it is not always done, but most desirable, that samples should be taken on receipt, and duly sealed—the one to be sent to the analyst for the seller, and the other to the buyer. Only in such conditions can discrepancies be avoided. I have had some Continental samples through my hands for the past few years, and one peculiarity occurred to me—viz., a certain proportion of hard nodules, which had to be broken up before a fair mean could be secured for analysis. Of course, this involves some little trouble, but simply comes within the range which an accurate analyst considers necessary for his work. As a matter of scientific interest, however, I made the following tests. I had a rather big sample sent me. A large portion of it was averaged in the usual way. The rejected residue was treated so as to isolate the hard nodules. The results were as follows on the dry basis:—

	No. 1. Whole Material.	Nodules. No. 2.
Organic matter and combined water	24·6	20·6
Insoluble siliceous matter	12·4	8·7
Total iron (as Fe_2O_3)	62·0	70·0
On nodules—		
Decrease of organic matter and moisture, per cent		4·0
Decrease of insoluble siliceous matter		3·7
Increase of Fe_2O_3		8·0

This proves the necessity of the analyst being very careful, in averaging a sample, to break up all the harder masses to fairly include in the average for testing

REGISTER OF PATENTS.

Steam Blast Gas-Burners.

Bennett, G. S., of San Francisco, California.

No. 17,176; July 26, 1907.

This invention comprises a steam generator mounted above the gas-burner and provided with nozzles for directing steam towards the jets of burning gas and in a direction opposite to its direction of flow after mixing with the burning gases. In a modified form of burner, the steam and gas nozzles are directed at an angle to one another. The nozzles, however, are both downwardly directed; and means are provided for reversing the direction of flow of the combustion gases and steam after they have intermingled.

The heat of the burner does not pass away quickly; and appreciable economy in gas is said to be effected from the fact that the steam blast is directed in the opposite direction to its direction of flow after mixing with the burning gases—the advantage being gained that when the burner is placed in a stove the velocity of the gases therethrough is no greater than the velocity of influx of the gas and the small amount of air necessary to burn it. It is in this respect that the invention differs from burners in which the gas issues from an upwardly-directed nozzle at an angle to which is arranged an upwardly-directed steam-nozzle supplied from a generator mounted above the burner proper.

Retort-Furnaces for Manufacturing Gas and Coke.

Koppers, H., of Essen-Ruhr, Germany.

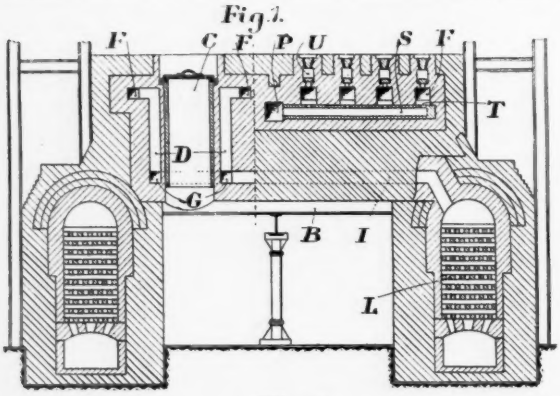
No. 17,858; Aug. 6, 1907.

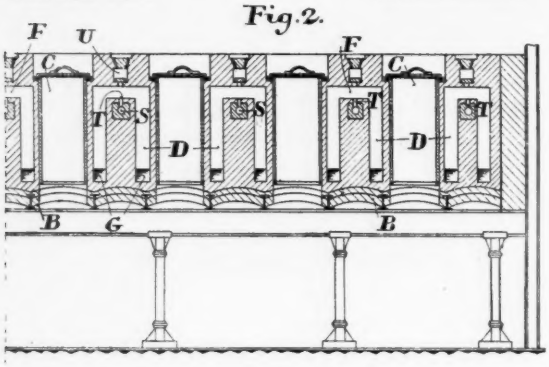
This invention relates to chamber or retort furnaces or ovens of the kind in which heating channels or chambers surrounding the retorts are connected with a gas-generator—the hot gases coming from the latter being burned in the channels when coming into contact with the fresh air of the draught. A recuperation of heat is effected in devices of this kind by the arrangement of two regenerators containing refractory material; the combustion gases which issue from the heating channels depositing heat in one of the regenerators before escaping, which heat is later imparted to a current of air which traverses the regenerator in the opposite direction—in which case the heat of the escaping combustion gases is stored in the other regenerator.

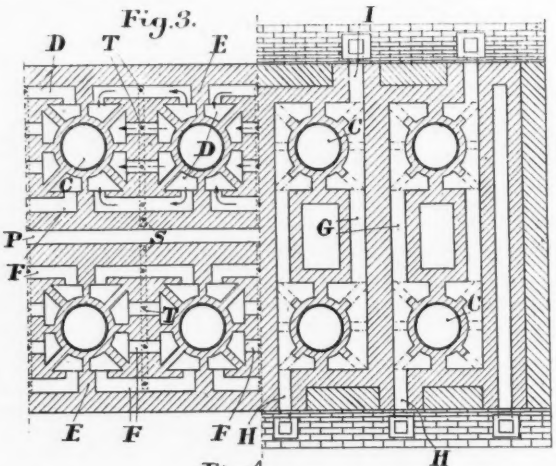
The essential feature of the invention consists in the use of gas-nozzles opening into the turned-back U-shaped heating flues, which are connected at one end to a channel leading to the one regenerator and at the other end to a second channel leading to the second regenerator, while the feeding of the hot gases coming from the generator is effected through the gas-nozzles arranged at the spot where the heating flues turn round. The working of the furnace is consequently such that the combustion air previously heated in one regenerator at first flows by itself through the one branch of the heating flue; encounters the hot gas at the spot where the flue turns back; and is ignited with the hot gas in the returning branch of the heating flue. After this, the resulting exhaust hot gases give off their superfluous heat in the second regenerator.

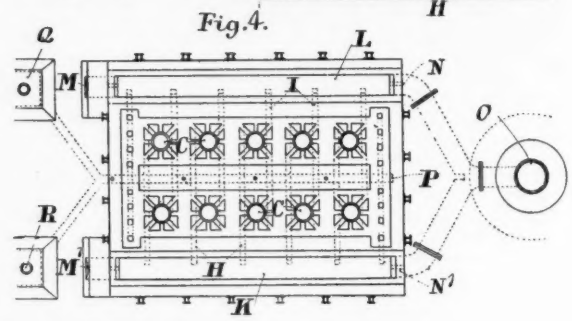
Fig. 1 (p. 392) shows a section through one furnace with regenerators arranged at the side—the section being partly through a retort and partly through the hot-gas channel. Fig. 2 is a longitudinal section through the retorts with their heating flues. Fig. 3 shows partly a plan view and partly a horizontal section through the group of retorts and the heating channel. Fig. 4 shows a plan view of the whole arrangement (drawn at a smaller scale).

The retorts C (which, for the purpose of being emptied through the bottom and for accessibility, are arranged on vaults B supported by columns) are open top and bottom, and can be closed in any suitable manner. The whole circumference of the retorts is surrounded by the heating flues D, which are separated from each other in the middle plane of each retort by a rising binder E; but in each case they are connected with the heating flues of the adjoining retorts by upper horizontal connecting channels F. To the right and left of the separating wall for the retorts arranged in twos beside each other, the heating flues are connected in the lower part through passages G and then connected alternately by channels H and I to the regenerators K and L running along at the side of, or below, the group of retorts. The regenerators may be made to communicate with the air through valves MM^1, and with the chimney O through valves NN^1. The gas-supply channel P passes between the retorts through the whole length of the furnace, and is connected at one end to the gas-generators Q R. In each case, beneath the connecting channels F, branch channels S are arranged and communicate with channels F through nozzle borings T.









Koppers' Retort Furnaces for Gas and Coke Production.

Access is given to this spot by perforations U in the axis of these borings, which can be closed by stoppers.

The working of the furnace proceeds as follows: When the valve M^1 is opened and the valve N^1 closed, the combustion air passes into the regenerator K, is heated on the fire-proof brick stuffing in it, and passes through the channels H and G into the heating flues D—in each case to the left of the binder E, in which flues it rises up. On passing through the channels F, the air encounters the hot gas at about 800° to 900° Celsius supplied from the generators Q R through the main channel P and the branches S, so that the combustion is effected downwards in the flues D. The exhaust hot gases flow through channels G and I into the regenerator L, where they give off their heat, and whence, when the valve M is closed and the valve N opened, they pass into the chimney O. Now if after working for a certain time the valves M or M^1 and N or N^1 are changed in the usual manner, the direction of the draught is immediately altered. In this case, with the continuous supply of hot gas, the combustion zone is merely displaced into the other branch of the U-shaped heating flues D. The absolutely symmetrical construction of the whole heating channel system, in each case referred to the middle plane between the two retorts, assures the uniformity of the heating for both directions of the draught.

Extracting and Manufacturing Fuel Gas from Mineral Carbonates and Organic Substances.

RIDER, C. H., of Saint Louis, Missouri, U.S.A.

No. 19,873; Sept. 5, 1907.

This invention relates to a process of generating carbon monoxide to be used as a fuel gas, which consists in mixing a mineral carbonate with an organic substance (other than coal or coke), such as leaves, straw, cornstalks, sawdust, or bark, placing same in an air-tight retort, in substantially the proportion specified, then applying sufficient heat to decompose the organic substance, or both the mineral carbonate and the organic substance, and then withdrawing the gas from the retort by suction.

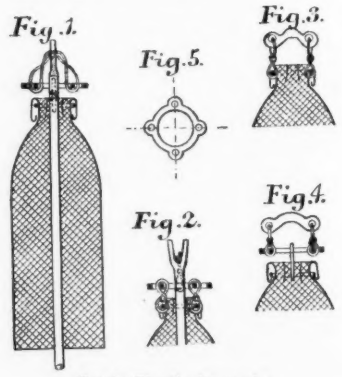
Link-Suspension Device for Incandescent Mantles.

FREY, F., of Darmstadt, Germany.

No. 3159; Feb. 12, 1908. Date claimed under International Convention, Feb. 20, 1907.

The zone on vertical incandescent gas-burner mantles which is most dangerous as regards breakage is (the patentee points out) situated at the place where the narrow meshes of the head become gradually wider—that is, at the place of transition from the head of the incandescent body to the body proper of the incandescent body. The attachment-ring as well as the suspension-stirrup consists either of a single piece or both are knotted together as a rigid system. From sheer necessity, all movements of the body support (particularly jolts) are thereby transmitted over the stirrup end attachment-ring to the incandescent body fabric. The present invention consists in providing "anti-vibrating link suspension devices" permanently attached to the incandescent body heads, as shown in the accompanying forms.

Fig. 1 shows in a vertical section one mode of suspending the mantle by a stirrup held on the central standard. Fig. 2 shows a similar view, at right angle to the former. Fig. 3 is a modification, where the stirrup is replaced by a rigid cross-bar like a scale beam. Fig. 4 shows a further variation, in which a balancing ring is inserted between the beam and the member holding the incandescent mantle. Fig. 5 shows the balancing ring itself in detail.



Frey's Mantle Supports.

By means of these "link-combinations," the effect is obtained that, "when the incandescent body support is jerked laterally, the incandescent body is not carried with the support, but during the first moment persists in its position of rest while a bending motion takes place in the links. Consequently no destructive moments arise in the dangerous zone of the incandescent body. Not until after a suitable interval does the incandescent body seek to come again into its stable position and executes a few short oscillations without danger."

APPLICATIONS FOR LETTERS PATENT.

15,922-3.—GLOVER, T., "Coin-freed gas-meters." July 27.

16,027.—RINCKER, F. G. C., and WOLTER, L., "Producing gas from tar, oil, or the like." July 28.

16,074.—DITTRICH, J., "Inverted burners." July 29.

16,091.—MUELLER, O. H., "Jet condensers." July 29.

16,157.—HILLER, E. G., and the NATIONAL BOILER AND GENERAL INSURANCE COMPANY, LTD., "Testing burner for producer gas plants." July 30.

16,249.—HECKERT, G., "Removing residue from gas-retorts." July 31.

16,263-4-5.—CHIPPERFIELD, W. H., "Compression of gas or air for lamps." July 31.

16,278.—LAKE, W. E., "Gas-lamps." A communication from Aurora Illuminating and Mantle Company. July 31.

16,286.—OWEN, C. M., and BERRYMAN, W., "Connection for joining flexible metallic tubing to gas-fittings." July 31.

16,333.—BÉCHEVOT, A., "Gas generators." Aug. 1.

16,351.—ROBSON, G., "Automatically lighting or extinguishing gas-lights." Aug. 1.

16,356.—LEWIS, D., and BRIGGS, M., "Internal combustion engines." Aug. 1.

16,364.—GAGLIAZZO, C., "Chronometers for lighting and extinguishing gas-burners." Aug. 1.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

Use of Electricity at the Newport (Mon.) Gas-Works.

SIR,—Lest misconception should arise out of the otherwise excellent report, in the last number of the "JOURNAL," of my few remarks upon Mr. Stagg's paper on "Inclined Retort Coal and Coke Handling Plant at Bristol," at the recent meeting of the Institution of Mechanical Engineers, I may perhaps be permitted to state that the Newport (Mon.) Gas Company use electricity for power distribution only; the whole of this power being generated by gas-engines at a far cheaper rate than it could be purchased locally.

Crindau Gas-Works, Newport (Mon.), Aug. 5, 1908. J. H. CANNING.

Koppers' Inclined Coke-Ovens.

SIR,—We have noticed in your issue of the 4th inst. a communication from Mr. J. D. Ashworth, in which he points out that he applied for a patent in 1902 for an inclined oven arranged similarly to that illustrated in the article on Koppers' ovens which appeared in the "JOURNAL" for the 28th ult. We beg to say that if Mr. Ashworth will read the article in question he will find that no patent is claimed by Mr. Koppers for arranging the ovens at an inclination, but that it is distinctly stated that a patent for a gas-oven arranged at an inclination had been taken out in the year 1901, which is anterior to the date mentioned by Mr. Ashworth.

We may add that the special advantages claimed for the Koppers' inclined oven is more particularly as regards the arrangement of the heating flues and the methods of regulating the combustion so as to attain perfectly uniform heating of the charge.

Per pro Koppers' Coke-Oven and Bye-Product Company,

Sheffield, Aug. 8, 1908. A. VICTOR KOCHS, Partner.

The Feld Centrifugal Gas-Washer.

SIR,—Replying to the letter of Mr. William Key in last week's "JOURNAL," we have carefully read the article to which he refers; and have also consulted the accompanying illustrations. We suggest that your correspondent makes himself acquainted with the process Mr. Feld has associated with his apparatus, and inspects the working section of the washer at the works of Messrs. R. & J. Dempster, of Manchester, which can be seen upon application. We are quite sure he will then realize that the Feld washer introduces an entirely new method of treating gas, and is a great advance upon all previous machines.

JULIUS HÜLSEN AND CO.,
Agents for WALTHER FELD.

Newcastle-on-Tyne, Aug. 8, 1908.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Bills Royal Assented—Adjournment till October.

On Saturday, the 1st inst., the Royal Assent was given to the following Bills, and Parliament rose till the 12th of October: Ammanford Urban District Council Water Bill, Audenshaw Urban District Council Bill, Blackburn Corporation Bill, Blaydon and Ryton Water (Transfer) Bill, Bognor Gaslight and Coke Company Bill, Briton Ferry Urban District Council Bill, Bromley and Crays Gas Bill, Burnley Corporation Bill, Bury and District Joint Water Board Bill, Camborne Water Bill, Conway and Colwyn Bay Joint Water Board Bill, Criccieth Water and Improvement Bill, Draycott Gas Bill, Garw and Ogmore Gas Bill, Gas Orders Confirmation Bill, Gas and Water Orders Confirmation Bill, Glyncorrwg Urban District Council Bill, Gosport Gas Bill, Holderness Water Bill, Keighley Corporation Bill, Leicester Corporation Bill, Lincoln Corporation Bill, Manchester Corporation Bill, Margate Corporation Bill, Padiham Urban District Council Bill, Pontypridd Water Bill, Ravensthorpe Urban District Council Bill, Rhymney and Aber Valleys Gas and Water Bill, South-West Suburban Water Bill, Southwell District Gas Bill, Stockport Corporation Bill, Swinton and Mexborough Gas Bill, Taw Valley Gas Bill, Wath and Bolton Gas Board Bill, and Wolverhampton Corporation Bill.

POLICE AND SANITARY REGULATIONS.

The Select Committee to whom were referred all Private Bills promoted by municipal and other local authorities by which it was proposed to create powers relating to police and sanitary regulations in conflict with, deviation from, or excess of, the provisions of the general law, presented their report last month, and it has since been issued. In the course of it, they furnish the following particulars.

Under the power given by the Order of the House, the Committee sat as two Committees during part of the session. They met first on the 20th of February, and subsequently sat on 34 days; and, in addition, the two sections of the Committee sat on 15 and 13 days respectively. Twelve Bills originating in the House of Commons and five originating in the House of Lords were considered. It was not found needful to exercise the special power given to refer any Bills to the Committee of Selection in respect of clauses with which the Select Committee deemed it unnecessary for them to deal. The Committee regard this power as valuable, and hope it will be continued in the future.

With a view to promoting uniformity in the method of dealing with the several Bills, the Committee at the commencement of the session issued instructions for the preparation of more detailed statistics of population, area, rateable and assessable values, all rates in the district, and existing loans, and of the staff of the local authority in each district. They were furnished, as in past sessions, with a "precedent Bill," showing the latest authority, where there was one, for each clause. In dealing with sanitary clauses, they required the Medical Officer of the authority to be always in attendance, and to furnish his last annual report. They also required the statement as to the purposes and works for which borrowing powers were sought to be verified on oath by the officer responsible for the estimate, and to be in sufficient detail to show the probable life of the works, and thus enable the Committee to decide on the appropriate term of years to be allowed for the repayment of loans. Their experience prompts the Committee to emphasize the necessity of arrangements being made by which the filled-up Bill, annotated with a reference to the latest precedent, if any, on each clause, may be in the hands of all the members of the Committee, and also of the Government Departments concerned, at least a week before the meeting of the Committee on the Bill.

The labours of the Committee were somewhat lightened, and expense was saved to local authorities, by the Public Health Acts Amendment Act of the session of 1907, by which many police and sanitary provisions became part of the general law, and may be obtained by application to the Home Office or to the Local Government Board. In their reports on the Private Bills of the session, the Local Government Board called attention to proposals originally embodied in the Public Health Bill of 1907, and afterwards omitted. In dealing with these, the policy of the Committee was to disallow all proposals which were rejected on their merits in that Bill, and to consider in the same manner as hitherto those which were dropped merely to lighten the Bill in its progress through Parliament. The Committee also decided not to allow local authorities to incorporate in their Bill sections of the Public Health Act of 1907 which could be obtained on application to the proper Department under the Act.

The Committee are of opinion that the time has come for Parliament to consider whether pressure cannot be brought to bear on local authorities to induce them, in the interests of ratepayers and inhabitants, to consolidate, and, where necessary, amend their Acts, by which means the labours of the Committee in several instances would have been considerably shortened, and a great deal of expense saved to the parties concerned. They also recommend that certain common terms, such as "new street," &c., should be defined by Statute. In view of the increasing demand for power to use sinking funds for new loans instead of borrowing in the open market, the Committee welcome the proposal to refer this question to a Select Committee.

Point as to the "Delivery" of Water.

In a case at the Mark Cross Petty Sessions, in which a Crowborough resident was summoned by the local Water Company for non-payment of a water-rate amounting to £1 13s. 7d., the point at issue was the level at which the water was "delivered"—the Company being entitled to charge 50 per cent. extra if the delivery was at a greater height than 700 feet. The Company contended that the delivery was at a cistern in the roof; while the defendant argued that the delivery must be said to take place where the supply-pipe entered the house, which was below the 700-feet level. The Bench came to the conclusion that the Company were not entitled to make the extra charge; but they agreed to state a case.

Compensation for Injuries to a Gas Worker.

At the Edmonton County Court last week, before his Honour Judge Wheeler, application was made by George Clarke, lately employed by the Tottenham and Edmonton Gas Company, for an award under the Workmen's Compensation Act. Mr. Blackwell appeared on behalf of the claimant; Mr. Giveen represented the Company. The applicant, a middle-aged man, formerly a soldier, had been in the Company's employ about four years. His wages had been 24s. 9d. a week; but during the last fortnight of his service he received 26s. 3d. weekly. At the date of the accident, the 18th of March, he was under a week's notice. On this day he was attempting to get a gas-stove from a motor-van into the Company's stores, when, as he alleged, his heel caught against a faulty iron plate on the floor of the vehicle, which caused him to fall backwards and sustain injuries. He was sent home, and remained in bed for seven weeks; and his case was that he was not fit to work until the 17th of June. Several doctors were called; and three who gave evidence for the respondents asserted that the symptoms shown by the applicant at the time of their examination indicated that there was little, if anything, the matter with him. His Honour awarded applicant compensation from the date of the accident to the end of June.

A Reporter's Imaginativeness.—In the early hours of Friday morning last, a serious fire broke out on the premises of Messrs. Wenham and Waters, a firm of heating, water, and electrical engineers, in Vicarage Road, Waddon. The premises were not far from the gas-works, and according to the report of the "Morning Leader" on Saturday, "from the first the greatest excitement prevailed over the fact." According to the reporter, "Loud demands were made for tarpaulins and rubber sheets, and with these articles parts of the gas-works where the flying sparks were expected to fall thickest were covered, while the other firemen deluged with water the end of the burning building nearest the gas-works." As a matter of fact, the distance between the burning building and the nearest structure (a pump-house) on the gas-works is at least 250 yards; and the "flying sparks" so much feared would have had to travel thus far against the wind. We understand that the resident foreman did not hear of the fire till it was over.

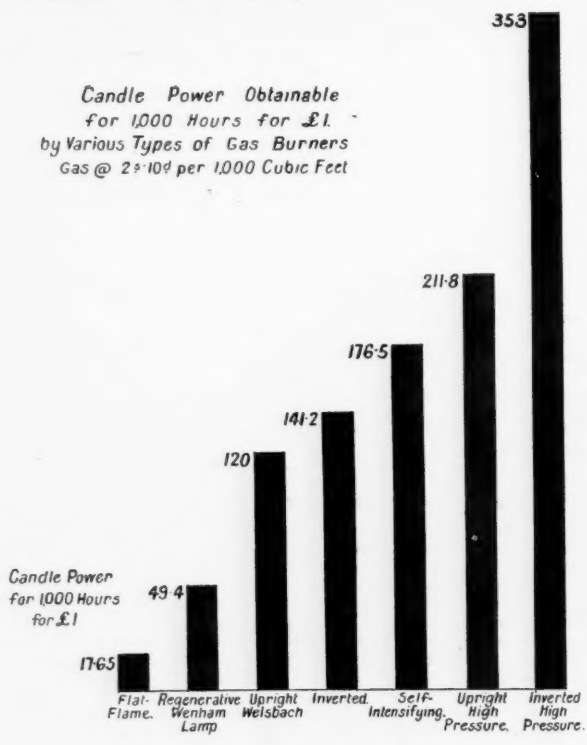
THE GASLIGHT AND COKE COMPANY.

The One Hundred and Ninety Third Half-Yearly Ordinary General Meeting of the proprietors of this Company was held last Friday at the Chief Office, Horseferry Road, Westminster—Mr. CORBET WOODALL (the Governor) in the chair.

The SECRETARY (Mr. H. Rayner) having read the notice convening the meeting, the seal of the Company was affixed to the Register of Proprietors. The report and accounts (which were given in the "JOURNAL" last week) were taken as read.

REPORT AND ACCOUNTS—FINANCIAL OUTLOOK.

The GOVERNOR: The year to which we looked forward with some anxiety, the year of exceptionally high-priced coal, is now passed; and from the accounts in your hands it will be seen that the Company have borne the strain remarkably well. Six months ago, I said the financial outlook for the half year was good; but the result has been better than my expectation. In two respects the record of the half year is disappointing. In the first place, we have sold slightly less gas than in the same period of last year; and in the second, the quantity unaccounted for has again increased. The diminished sale is fully accounted for by climatic conditions; and the substitution of new lamps for old, of methods of burning which are increasingly economical from year to year, has added to the volume of light while enormously reducing the quantity of gas needed to produce it. One comparatively small Railway Station has reduced its consumption in this way by 3 million cubic feet, and a City warehouse by $2\frac{3}{4}$ millions. These are only types of thousands throughout the district. We welcome every improvement in this direction; but their immediate effect is to curtail our business. The simple inverted incandescent burners give a light eight times better than good flat-flames, or, in other words, the same light can now be obtained from 1000 cubic feet which would have required 8000 cubic feet a few years ago. With gas used at high pressure, the increase is not eight times, but twenty times. [Here the Governor directed attention to the diagram, showing this development of illumination, as here reproduced.]



UNACCOUNTED-FOR GAS.

With regard to the quantity of unaccounted-for gas, I have no satisfactory explanation to offer. We made and sent out from the manufacturing stations $\frac{1}{2}$ per cent. more than in the June half of 1907. The quantity sold being $\frac{1}{2}$ per cent. less, there is an additional 1 per cent., or 122 million cubic feet, missing. Since the accounts were closed, I have had a conference with the chief officers concerned; and we have carefully considered the possible causes of the loss and the remedies open to us, and the matter will continue to occupy our close attention. One cause of the loss is no doubt the recent great increase in the weight of vehicles using the public roads, and the speed at which they are run. While this is a danger beyond our control, other aspects of the nuisance are attracting the attention of the public and of the Government; and possibly there may be an improvement shortly. With the limitation named, the accounts are, I think, satisfactory. The gross expenditure on capital account in the half year was £39,500—nearly all, as usual recently, upon mains, meters, stoves, and distribution work generally. Against this, we have to set £15,000 received for a piece of land sold at Haggerston, and depreciation upon plant and apparatus to the amount of £41,500—in all, £56,500; so that there is a credit balance to capital of £17,000. In addition, the contribution to the redemption fund provided for in the Company's Act of 1903 operates to reduce the capital by a further £10,000. The income from gas sold shows a falling off of £31,000. The reduction in the price charged amounted to £40,200, and the reduced sale £5200—in all, £45,400. The difference between this and the £31,000 in the accounts is due to some advantage gained on the south side of the river, and in public lighting. On the other hand, meter-rents amounted to just over £29,000 for the half year. This is the first period over the whole of which meter-rents have been collected; and the revenue from this source is practically what was estimated. Owing to the increase in gas-stoves on hire in the district, which amounted during the half year to 10,000, there has been an increase of nearly £2000 in the stove-rental. The revenue from coke and other residuals has been considerably higher—yielding an increase of £70,000; and the increased income from all sources, after allowing for the decrease in gas-rental to which I have referred, amounted to £75,000. On the expenditure side, coal, oil, &c., cost us in all £111,000 more than in the corresponding half year; so that, after taking into consideration the increased revenue of £70,000 from residuals, the net increased cost of coal and oil was £41,000. With regard to the working expenses, there has been a further improvement in manufacturing costs representing a saving of £13,000. Wear and tear also shows a reduction of £28,000. This is not due to any cutting down of necessary work, but to the fact that the June half of 1907 was an exceptionally heavy one, and the figure is now more nearly normal. Since our last meeting, the retort-settings in No. 8 House at Beckton have been reconstructed and the house thoroughly refitted. The work at Fulham then referred to—involving the practical rebuilding and equipping of a large retort-house and the removal, reconstruction, and rehousing of the carburetted water-gas plant—is well advanced, and the new works will be in use in the coming winter. No effort and no expense are being spared to bring the whole plant into a state of high efficiency. Upon distribution, including salaries, wages, wear and tear, meter and stove repairs, and gas-fittings, there is a net increase of only £3500. Only one other item calls for notice—the contribution to the insurance fund. As was indicated last half year, we feel that in the case of a Company like ours, doing so large a business involving a certain amount of risk, it is wise that this fund should be equal to any call which may be made upon it; and we have therefore availed ourselves of the satisfactory financial result of the half year to place £10,000 to its credit. The net result of the half-year's working is that, after providing for fixed charges and setting aside £10,000 towards the redemption fund in accordance with the Company's Act of 1903, there is a profit of £406,433 19s. 1d. Adding the amount brought forward from the previous half year—namely, £349,551 0s. 9d., the total available for dividend is £755,984 19s. 10d. Out of this sum, the Directors recommend a dividend at the rate of £4 10s. 8d. per cent. per annum, leaving £412,298 6s. 1d. to be carried forward.

INCREASE OF DIVIDEND.

It will be noticed that the Directors recommend an increase of 2s. 8d. per cent. in the dividend. Many of you are doubtless aware that the Company have been entitled to an increased return since the price of gas was reduced in 1904, with the exception of last year, when, owing to the reinstatement of meter-rents, we agreed with the London County Council to a reduction of 1d. in the standard price of gas. The higher dividend was not paid, as it was felt that the financial position of the Company was not such as to make it advisable to increase the distribution of profits. Owing, however, to the 1d. reduction in January last, the Company are now again entitled to distribute an extra dividend; and the Directors are of opinion that, in view of the continued good working of the Company and the prospect that the advance made will be continued, there is no reason for further delay. The cost of this extra dividend will be £20,000 per annum; while to the consumers the reduction of price means more than £80,000. With regard to the future, as has been pointed out in the report, contracts for coal have been made for the coming twelve months at prices showing a reduction. It is improbable, however, that the Company will obtain such good prices for their bye-products as they have been doing during the past six months, and the net saving may consequently be comparatively small. I am glad to say, however, that, after fully considering all the circumstances, and as a result of careful estimates, I confidently expect that a further reduction in price will be announced before our next meeting in this place.

EMPLOYEES' SAVINGS BANK.

The Directors, anxious to encourage thrift among the workmen, and recognizing as they do the difficulties in the way of saving money out of a weekly wage, have opened a savings bank at each of the various works, and a start was made on June 12. We believe that the men appreciate the advantage which is offered to them, and that the bank will be a source of considerable benefit.

FRANCO-BRITISH EXHIBITION.

At the Franco-British Exhibition, now being held in London, there has been arranged an interesting demonstration of the domestic uses and application of gas. The members of the Committee in charge of this exhibit represent a considerable number of gas companies and corporations and are to be congratulated upon the success of their labours. The Company contributed substantially to funds required; and shareholders would I think derive instruction and pleasure from a visit. The French Society of Gas Engineers, under the presidency of M. Coze, paid a visit to London last month; and it was our great pleasure to receive and entertain the members at the Exhibition. The Society numbers among its members many distinguished French gas engineers, who have always been most cordial in their relations with their English colleagues. Since the return of our guests to France, we have received acknowledgments, very cordially expressed, of the pleasure which the visit afforded to them.

TRAINING OF WORKMEN AND FITTERS.

The training of workmen, to which reference has been made more than once, is being continued. The scheme of which I spoke at the last meeting, for the training of youths as fitters by a system combining practical instruction in the Company's workshops with theoretical training in the Technical Schools of the London County Council, is making substantial progress. I am glad to report that the Council

have given their cordial approval and support. In a report upon this of the Polytechnic and Technical Institute by the County Council at the end of June, they say: "In this respect the Gaslight and Coke Company have followed the lead of the War Department in the arrangements which they have made for the training of the Arsenal apprentices in the Woolwich Polytechnic; but the present is, we think, the first case in which a commercial company have taken this action. There have been many other cases in which persons interested in a particular trade have asked the Council to assist in the training of their employees." The shops are in course of construction on these premises; and the plan will be in full work before the end of the year.

MAY'S YARD EXPLOSION.

Some remark was made at our last meeting as to an explosion which had taken place at May's Yard, Holborn, with the result, unfortunately, of the death of a working man. With regard to the £1800 debited to the insurance fund on account of claims arising out of the explosion in May's Yard, Holborn, on July 30, 1906, which unfortunately resulted in the loss of one life and considerable damage to property, I am glad to be able to state that the escape of gas was not in the first instance caused by any default of the Company. It was due to an act of folly on the part of an employee of the firm on whose premises the explosion took place. The Directors were therefore justified in denying liability and in contesting an action for compensation. This action resulted in an adverse decision, on the ground that there was contributory negligence on the Company's part in not discovering an underground accumulation of gas in time to prevent an explosion. A number of claims which were awaiting the result of the action had thus to be met; and the majority of them have recently been settled. There will, however, be a further charge upon the insurance fund in the next half year's accounts. While deeply regretting the occurrence in question, the Directors, as I think I have before mentioned from this chair, feel it to be a matter of congratulation that so few accidents happen within the Company's enormous area of supply. The total compensation paid for accidents on the Company's district causing injury to persons or property in the year ended June 30 last was only £71.

COAL MINES (EIGHT HOURS) BILL.

Two Acts of Parliament have been attracting attention as of interest to gas companies. The first is the Coal Mines (Eight Hours) Bill. This measure has made some advance, but has not yet been passed by the House of Commons. A decision which has already been arrived at to defer its operation for five years, is recognition of the strength of the opposition case. If trade continues to decline, no Act of Parliament will be able to keep up the price of coal; but the limitation may, and probably will, operate to depress unnecessarily the wages paid to miners.

PORT OF LONDON BILL.

The Port of London Bill has been considered and passed by a Joint Committee of both Houses of Parliament. The object of the Bill is to transfer the control of the Port and Docks of London to a Board or Commission who will represent as fully as may be the various interests affected. We lodged a petition, not with the object of obstructing the Bill, but in order to secure, if possible, a limitation on the amount of dues which the new authority might impose on coal entering the Port. The Committee, after hearing Counsel, decided not to accept evidence nor to impose any limit on dues. The rates to be charged will be considered by the Port Authority and referred to the Board of Trade, who will hear parties affected before giving their approval. The Board of Trade will embody these rates in a Provisional Order; and anyone feeling aggrieved can oppose the Order before one or both Houses of Parliament. There seems, therefore, adequate protection against ill-considered or excessive charges. The need of improving the Port is generally, almost universally, admitted; and the concentration of the control in the hands of a responsible and capable authority seems to be eminently desirable. The prosperity of London is bound up with that of the Port; and the continued success of such Companies as ours is entirely dependent on that of London. Hence we must wish well to any wise scheme for improving the Port, and are willing to contribute a fair proportion to the cost. With these observations, I beg leave to move—"That this meeting do agree with, and confirm, the report of the Directors and the Auditors' report and statement of the accounts of the Company as transmitted to the proprietors on the 30th ult."

Mr. HOWARD C. WARD (the Deputy-Governor) said he had much pleasure in seconding the motion.

The GOVERNOR having invited discussion,

Mr. C. E. JONES said he was convinced that the proprietors were much indebted to the Governor for the lucidity of his explanation of the matters referred to in the report. The ground he had traversed had been very interesting indeed; but he (Mr. Jones) thought that the Governor had been a little melancholy with respect to the future prospects of gas. With all respect, he did not altogether feel that apprehension to which the Governor apparently had felt constrained to give expression. The coming into line with other gas undertakings in the kingdom was very creditable to the Company, as it extended the area of its foundation, and thereby greatly enhanced the property belonging to the proprietors. He still believed in the usefulness of gas, and in its extension very materially, although it was contrary to the almost universal prediction of the admirers of electricity that the gas industry would be rapidly annihilated. Up to the present, very little damage had been done to the gas industry; and nothing better illustrated this than what took place in Paris the previous day. He had always thought that the concentration of the industry at one or two points was a mistake; and the result of the labour strikes had shown that this conclusion was right. Owing to the concentration of artificial light in Paris, through some labour troubles the whole city was on Thursday evening plunged into darkness. This could not happen with gas in this country, as there were so many sources of supply that if one failed they had only to put pressure on the others. He was old enough to remember the strike in London forty years ago when the result was similar. At that time the old Horseferry Road station did its duty; it stepped into the breach and kept the light up till relief came from some of the other stations. The Governor had not referred in his address to a fine of £25; and it would be interesting to hear how they incurred the displeasure of the Gas Referees. For his part, he thought the time had arrived when such harassing legislation as enabled the fine to be imposed should be removed from the Statute-Book.

The GOVERNOR: In reply to Mr. Jones, I have only to express my regret if my address had a melancholy tone about it. I was unconscious of it myself. No one in this room feels more confident than I do with regard to the future of the gas industry; and I think that the record we have put before you to-day is one that shows what vitality there is, not simply in the industry, but in this Company of ours. I suggested in my address that at the end of the year we expected to announce another reduction in the price of gas, which will mean that within two years we shall have taken £160,000 a year off the shoulders of the gas consumers, coming entirely out of the profits of the undertaking. I think that, even for so large a Company as ours, that is a record that should go far to satisfy anybody who may have any doubts as to our future. With regard to the fine that was inflicted, you must know that the Gaslight and Coke Company's gas is tested at fourteen different stations over the Metropolis; and there are circumstances that may happen at individual stations that cause the light to be apparently reduced in value—as, for instance, the circulation of the gas, and the personal equation of the testers. In this particular case, the Chief Gas Examiner, when appealed to, said that the report of the Examiner must stand; he must impose the fine. But at the same time he said that the fault was not substantial, nor due to careless conduct on the part of the Company. Nothing could be more satisfactory than this observation, though he had to accept the report that the gas was below the minimum.

The motion for the adoption of the report and accounts was then put, and carried unanimously.

THE DIVIDENDS.

The SECRETARY then read the minute of the Court of Directors recommending dividends for the past half year as follows:—

Resolved, that it be recommended to the half-yearly ordinary general meeting of proprietors to be held on the 7th prox.:

(1) That dividends as follows for the half year ending the 30th of June last be declared, namely—
On the 4 per cent. consolidated preference stock at the rate of £4 per cent. per annum.
On the convertible £5 per cent. preference stock at the rate of £5 per cent. per annum.
On the 3½ per cent. maximum stock at the rate of £3 10s. per cent. per annum, subject to deduction of income-tax.

(2) That out of the divisible profits for the said half year remaining after the payment of the foregoing dividends, the sum of £10,000 be set aside towards the redemption fund, in accordance with the provisions of the Company's Act of 1903.

(3) That out of the balance of divisible profits for such half year amounting to £755,984 19s. 10d. and applicable to dividend on the ordinary stock, a sum of £343,686 13s. 9d. be set apart for the payment of dividend for the said half year on the ordinary stock of the Company, and that such sum be appropriated in payment to the proprietors of ordinary stock of a dividend for the said half year at the rate of £4 10s. 8d. per cent. per annum, subject to deduction of income-tax, and in payment of a forfeiture incurred during the half year amounting to £25.

The CHAIRMAN: I beg to move that resolution.

Mr. WARD seconded, and it was carried unanimously.

VOTES OF THANKS.

Mr. BAILEY then proposed a vote of thanks to the Court of Directors and the staff for their services during the past year. Every proprietor must feel, he said, that the success of the undertaking was largely bound up with the manner in which their affairs had been conducted; and during the past year they had been undoubtedly well conducted. When they looked round and saw how many large commercial undertakings were receiving decreased dividends, they had every cause to congratulate themselves on their prosperity.

Mr. J. REESON had much pleasure in seconding the motion.

The motion was then put and carried unanimously.

The GOVERNOR: Ladies and Gentlemen, on behalf of my colleagues and myself, I thank you for this vote. We are ourselves entirely satisfied with the result of the working; and I take this opportunity of saying how much we recognize the great assistance rendered to the Board by the admirable co-operation of the officers, staff, and workmen of the undertaking. I do not think that we could desire any better condition of relations than exists at the present time right through the staff. I may here mention that we are on the eve of losing the Engineer of our Kensal Green station, Mr. M'Minn, who is retiring after 48 years of faithful service to the Company, and taking with him the good will and respect of the Directors and of his colleagues. We all wish him many years of life to enjoy the pension that has been granted to him.

Mr. D. MILNE WATSON (the General Manager): Gentlemen, in the name of the staff and of the employees, I beg to thank you very heartily for the kind way in which you have referred to us. I can assure you that our best endeavours will always be to improve the position of the Company, and to serve you faithfully.

Colne Valley Water Company.—At the half-yearly meeting of this Company at Bushey last Tuesday, the Directors reported that the profit on the revenue account for the half year ending June 30 amounted to £14,028, and the balance of the dividend and interest account, after paying the interest on the debenture stock and preference shares, was £15,112. From this they transferred £500 to the contingency fund account, and recommended the payment of the full statutory dividends at the rates of 10 and 7 per cent. per annum on the two classes of shares; leaving £4204 to be carried forward. For the corresponding period of 1907, the dividends paid were the same, and £1292 was carried forward; but in view of the reduction of the water-rates which will take place next year in accordance with the Company's last Act of Parliament, the Directors considered it advisable to take over a larger amount than on previous occasions.

SOUTH SUBURBAN GAS COMPANY.

The Half-Yearly General Meeting of this Company was held last Friday, at De Keyser's Royal Hotel, E.C.—Sir GEORGE LIVESEY in the chair.

The SECRETARY (Mr. Charles M. Obren) read the notice calling the meeting; and the Directors' report and the statement of accounts—as summarized in last week's issue—were taken as read.

REDUCTION IN CHARGE FOR GAS—PRICE OF COAL.

The CHAIRMAN, in moving the adoption of the report and accounts, said the Directors had, as was remarked in the opening paragraph, great pleasure in presenting the report, because they were in a position to announce a reduction in the price of gas to 2s. 6d. per 1000 cubic feet as from Midsummer last. There were people who would not give them credit for the statement he was about to make; but he could assure the proprietors that it afforded the Directors greater pleasure to reduce the price of gas than to raise it. It was just the reverse of pleasure when circumstances forced them to increase the charge. The second paragraph dealt with the price of coal. Three years ago coal f.o.b. in the Tyne was 7s. 6d. per ton, or 40 per cent. lower in price than it was at this time. It had now come down somewhat, but not nearly so much as they had either hoped or expected, or that the depressed condition of trade required. When the contracts for coal expired in March last, the Directors had tenders from both Newcastle and Yorkshire; but the new contracts had not yet been made. They had been living from hand to mouth; and they had lived very well. There was not the slightest difficulty in getting coal. Their stocks had been increased during the past three months; and they were getting coal with as great facility as if they had entered into contracts. This was tolerably good evidence that there was plenty of coal to be had; but the coal people, having got the price up to this high figure, were very unwilling to bring it down. There was no doubt the price must come down; and he thought it would be found the Company would do quite as well as any other company in the coming year.

COAL MINES (EIGHT HOURS) BILL.

There was one cloud in the sky. The Coal Mines (Eight Hours) Bill had been taken up as a Government measure; and the reason the Government had given for this was a most extraordinary one. They said the measure had been before Parliament for twenty years; and it was time it was settled. If this was to be the governing basis of Acts of Parliament, it was only necessary for the extreme Socialists to bring in a Bill (say) for taxing incomes to extinction above a certain moderate amount; and, by persevering with the Bill year after year, the Government would say, "This has now been before Parliament long enough; therefore we will take it up, and settle it." A weaker argument he had never heard. The Gas Companies had done what they could in opposition to the Coal Mines (Eight Hours) Bill; but some of them in consequence had been found fault with for going into political matters. Who made this a political matter? It was an economic question—a question concerning the business and trade of the country, and very seriously affecting the industry of the country. The Government had taken it up, and said they would father it, and make it a Government measure. But the only object of the Bill was to increase the price of coal. This had been stated over and over again; and there had been really no denial. The coal miners, or rather the Socialist leaders of the coal miners, wanted to see coal considerably dearer, because their wages, being governed by the price of coal, would become permanently higher, while everybody else would suffer. Opposition would be given to the Bill to the very last. Of course, a parliamentary battle was never lost until it was won; and there was even great hope that this obnoxious Bill would not be passed into law. It was obnoxious on the ground he had stated, and still more so as an interference with adult labour—adult labour which had shown how well it was able to take care of itself.

RELATION OF COAL AND COKE PRICES.

The next paragraph in the report mentioned that, in the half year, the Company had spent £6716 more for coal than in the corresponding period of 1907; while the receipts for coke had only increased by £1926, or less than one-third. It was commonly said that if coal went up in price, coke went up also, and that one nearly balanced the other; but, as a matter of fact, it was not so—it did not nearly balance, as their accounts showed.

BETTER HOPE FOR TAR.

Tar and ammonia were rather better; and there was really a little hope for tar now, because there was a large demand springing up for it in road making. Many things had been tried to make dustless and water-proof roads, and, after all, there was nothing like tar, and it held the field. He was told the other day by Colonel Crompton, who was much interested in motors, that the great North-Western Road from London to Coventry was all tarred; and that it had been found by actual experiment that where the road was tarred the power required for traction was much less, and therefore considerably less petrol or fuel was used for dragging heavy loads along tarred road than on ordinary good macadamized road. It was hoped that this would tend to some extent to take the surplus tar out of the market. Tar, from which so many inestimably valuable products were obtained, was now worth nothing more than its fuel value. There was, however, as he said, a little hope in the extension of the use of tar for road making; and he expected that before many years were over most of the roads in the kingdom would be tarred. He was told that the cost of maintenance per annum for a tarred road was £40 per mile for a road 6 yards wide. This seemed a low price indeed.

THE BALANCE.

Then in the report the Directors told the proprietors that some economies had been effected in manufacture in the half year, with the result that the balance to be carried to net revenue account was sufficient to enable them to pay a dividend at the rate of the £5 6s. 8d. per cent. authorized under the sliding-scale. The profit was also sufficient to increase the amount to be carried forward to £8253; and there was one important thing left out of the report—the balance was also sufficient to warrant a reduction of price, which was the most important of all.

CO-PARTNERSHIP.

There was a long paragraph in the report relating to the question of co-partnership; and this paragraph spoke for itself. There were only one or two points in reference to it to which he might draw attention. It was said in the report: "We pay the current rate of salaries and wages, governed by the law of supply and demand." He thought he might say for the Board that it had always been their practice not to interpret this rule too strictly, and not to pay just the bare wages or salaries that were sufficient to meet the condition of supply and demand. Gas companies generally had hitherto paid the full market rate, at which an abundance of men could be obtained, and eager to enter into their employ. The co-partnership bonus was a clear addition to that. In other words, the Company paid the full market rate of wages and salaries; and beyond that they had applied the principle of the sliding-scale to the employees—the bonus, like the dividend, being governed by the price of gas. Thus they identified and united the interests of consumers, proprietors, and employees.

THE SLIDING-SCALE THE IDEAL SYSTEM.

The other day he read an interesting article in "The Times" [Aug. 4] in which trusts were alluded to. The article applied chiefly to America, where there were extraordinary combinations of capitalists. A Committee of the American Bar Association, reporting on the matter, said: "Competition is coming to an end. The corner stone is crumbling; and the structure is in danger. Combinations of combinations are appearing; and the reign of a few industrial despots is at hand." As far as gas is concerned, he thought they had found the remedy. Competition in most cases was necessary to protect the consumer; for without competition, as in the case of these trusts in America, the interests of the consumer went to the wall. But by the system of the sliding-scale as applied to gas, the interests of the consumer were duly considered. Parliament had enacted that gas companies might increase their dividends by reducing the price of gas. Therefore, the sliding-scale made it to the interests of gas proprietors to sell gas as cheaply as possible. Then they had extended the same principle to the employees. He therefore thought, in reference to these rather ominous remarks about competition, they might say there was a remedy. If they could by any means identify the interests of producers or capitalists, workers, and consumers, they would have an ideal system; and this seemed to him to be found in the gas sliding-scale system. A good deal was said nowadays about capital generally. The Parliamentary Secretary of the Local Government Board made a speech in July, on the subject of capital, at the Albert Hall, in which speech he said something to the effect "I will not say capital is immoral, but it is unmoral." So far as he (Sir George) could make out, what the gentleman meant was that moral principles do not apply where capital was concerned. Capital was regarded by some people as a purely and utterly selfish matter; that in people doing the best possible with their capital, they were thought to be utterly regardless of all moral considerations. This was, he considered, rather hard on capitalists; and it seemed to him to be a very big mistake. He did not think the proprietors of this Company would wish the Directors to act in that spirit towards anybody—either towards the consumers or the employees. He believed it was the wish of the proprietors that the Board should deal fairly and considerately, and with due regard to the moral principles, in their relations with both employees and consumers. He had received a letter from an investor (he did not know whether he was a gas shareholder), in which the writer said that a good many shareholders were anxious about their investments, and that they did not like to feel that their money was invested in a business with which their consciences did not approve. This correspondent suggested that companies should explain in what way they deal with their employees. That was one of the reasons for the length of the paragraph in the report dealing with this question. It was intended to show that they tried, at any rate, to deal fairly and considerately with their employees. The result was they had good and faithful service. He thought he might say that the relations of the Company with the employees of all ranks were of the most satisfactory character. They were trying to help the employees to improve their position—helping them, in fact, to help themselves; and if they could help their men to become owners of property, and thereby induce them to become thrifty, it would increase self-respect, and make them better men, and thus better servants. So the system was a benefit not only to the employees but to the proprietors and consumers. The Directors wished to conduct the business in the best and most efficient manner. One of their reasons for adopting the co-partnership system was to get the most efficient service. The Board were anxious, when introducing machinery, to get that which would be economical and efficient; and they also wanted to get the most efficient service. When it was remembered that, next to coal, the chief item of expenditure was about £58,000 a year for salaries and wages, it would be seen what an enormous loss might result in this item alone if they were not efficiently served. This was one of the reasons—one of the chief reasons—why they had adopted this principle. And the Board were glad to tell the proprietors it was working very satisfactorily.

Mr. JOHN BORASTON, in seconding the motion, said the reports of the South Suburban Company, if not absolutely unique, were at least somewhat unusual in their character, because, while they placed before the proprietors important facts relating to the prosperity of the Company and other details, they at the same time referred to the co-partnership scheme as carried out so successfully in connection with this undertaking. One of the chief characteristics of the highest form of literary composition was reticence. The opening paragraph of the report seemed to be remarkable for its reticence. It mentioned the fact that there was a reduction in the price of gas, and that it would represent a saving to the consumers of £5500 a year. They, as proprietors, hoped it would lead to something else. The one thing that had struck him in his short official career as a Director had been the good feeling that characterized all classes of the service from top to

bottom. There was trust, confidence, respect, and esteem right through the service; and it led to the best possible work. Beyond all doubt, the explanation of this characteristic of their work was to be found in the principle of co-partnership, which formed an integral part of the base of their commercial success.

The motion was unanimously carried.

The DEPUTY-CHAIRMAN (Mr. Robert Morton) proposed the declaration of a dividend for the half year at the rates per annum of 5 per cent. on the preference stock and 5⅛ per cent. on the ordinary stock, less income-tax.

Mr. W. G. WALLER, in seconding, remarked that he wished to thank the proprietors on behalf of the employees for the handsome bonus they had received for the past year; and he was pleased to again testify to the great good this co-partnership had wrought, not only financially but socially, which, in his opinion, was much more important. The employees were most grateful for what had been done for them; and they would all endeavour to do their utmost for the prosperity of the Company.

The CHAIRMAN remarked that the Board hoped the next dividend would be at the rate of 5⅛ per cent. The Directors thought the proprietors as well as the public should have what was due to them.

The proposition was agreed to.

TARRED ROADS AND MOTOR TYRES.

Dr. J. SIDNEY TURNER, in proposing a vote of thanks to the Chairman and Directors, alluded to the question of tarring roads. He said he believed that Tarmac made excellent roads; and he could quite well believe that, by making a less frictionless surface, less power was required for traction. There was, however, a drawback to it such as those who had motor-cars would readily understand. The effect on india-rubber was detrimental; and the effect on the varnish was also of a detrimental character. Those who had this matter in hand should try to find some means by which these detrimental effects of tar could be obviated, because tar undoubtedly furnished the best surface a road could have from the hygienic point of view, as well as a regular and slipless surface. So far as the notion of sharing with the employees was concerned, it did not want any argument. The result was before them; and the result was as good as it possibly could be. Might he also congratulate the Directors upon having Mr. Boraston on the Board. A more excellent coadjutor they could not have. He was pleased to think their choice had fallen on so good a man.

Mr. G. T. POWELL seconded the motion; and it was very cordially passed.

The CHAIRMAN, having acknowledged the vote, alluded to Dr. Turner's remarks as to the use of tar on roads. What Dr. Turner complained of was not the fault of the tar, but the fault of the surveyors who put it on the roads. Some of them had found out how to do it. Mr. Angel, of Beckenham, knew how to satisfactorily use tar. The road must be perfectly dry; or, as one tar road maker put it, the road ought to be thirsty, so as to suck in the tar as deeply as possible, and then the tar should be covered over with granite chips or sand, so that there should be no exposure of the tar to the tyres. They were learning how the work should be done; and there had been great improvements made even compared with last year. As producers of tar, the Company would do what they could to put users for this purpose in the right way to get the best effect. There was one thing more to be done, and that was to express their thanks to the officers and employees. They were well served by Mr. Shoubridge and the officers and workmen in the manufacturing department, and by Mr. Ohren and his staff.

Mr. CHARLES HUNT seconded the motion; and it was heartily agreed to.

Mr. SHOUBRIDGE, on behalf of the engineering staff and the workmen, thanked the proprietors very cordially for their kind recognition of their services. He was glad to be able to testify that during the half year there had been the greatest unanimity and heartiness in the working of all classes of employees; and he was sure they had done their best for the good of the Company. They had been sorry to notice there was a slight falling off in the sale of gas during the past half year. But it was gratifying to know there had been an increase in the number of consumers—nearly 500 more than there were this time last year; there had been a great increase in the number of gas cookers; and there had been an enormous increase in the number of gas-fires, amounting to about 37½ per cent. In incandescent lighting, too, there had been further adoption. The slight falling off in the gas consumption must therefore be due to the more economical methods of using gas by means of incandescent burners and improved appliances. This was not a matter for regret, because it added much to the stability of the Company.

Mr. OHREN, on behalf of himself and staff, said they did strive to earn the kind proposition the Chairman made; and for it they thanked him, and the proprietors for their endorsement, very heartily.

BRENTFORD GAS COMPANY.

Satisfactory Increase in Consumption—Test Burner Question.

The Half-Yearly Ordinary General Meeting of the Company was held last Friday at St. Ermin's Hotel, Caxton Street, Westminster—Mr. ULICK J. BURKE in the chair.

The SECRETARY (Mr. William Mann) read the notice convening the meeting; and the report and accounts (which were noticed in last week's "JOURNAL," p. 342) were taken as read.

The CHAIRMAN said it was his pleasure again to be able to congratulate the shareholders very heartily on the statement of accounts. The increase in the quantity of gas sold in the half year was 7·61 per cent.; and there was a sum of £100,098 available for dividend. The number of both ordinary and automatic consumers had increased, when compared with the corresponding period of 1907—the ordinary by 611, and the automatic by 5848. This was what he might call a highly gratifying condition of affairs. It was the "pulse," as it were, of the situation—that was to say, if they had an increase in the number of consumers and an increase in the consumption, it showed the Company were in a satisfactory position. If they wanted a closer diagnosis, they would have to look at other items in the accounts. He would again call their attention to the capital account, because it was always satisfactory to notice the manner in which they had been writing-down this account, until now the capital per ton of coal carbonized was as low as £4 8s. 7d., which was most satisfactory. Coming to the revenue account, it would be noticed that coal had cost considerably more; the figure on the present occasion being £99,347, as compared with £86,363 in the same half of the previous year. As a matter of fact, it would be seen from the accounts that they had actually not earned their dividend by about £2000; but this was rather an illusory statement, because what they had done was this: As the Board had informed the shareholders before, the Company, like other gas companies, needed a good deal spent upon it to bring it up to date. The whole policy of the Company had been that this was a wise thing to do. He had told the shareholders some time ago that they would have to spend money; and they had done so. At the present time they were laying a 30-inch main from Southall to Brentford. It would be impossible for them to go on supplying gas with their present increases, unless they extended their plant or connected the two stations by means of a bigger main. It was the latter course which they had adopted; and it accounted for £5000. Another £1200 they had had to spend on boilers at Brentford. They found they had to put down two new boilers in one part of the works; and they also moved the boilers from the water-gas plant to the same spot, to economize labour. Another point was that there was an increase under "Distribution" in the item of "Salaries and wages of officers (including rental clerks)," which in the accounts under review figured at £7619, against £5502 the previous year. This increase was accounted for mainly by the fact that the Board had made it their aim to put themselves in very much closer touch with consumers than had been the case in the past. They found it was quite necessary to spend money in this way; and he believed that the outlay would justify itself. They had increased their show-room accommodation, and had arranged for some excellent lectures, which had proved exceedingly popular. The result was that people were beginning to realize what gas really was. An increase of 7·61 per cent. was a very good one, considering the weather conditions that had been experienced, and other matters. Of course, it had to be remembered that with incandescent upright and inverted burners, a large increase in light was obtained without a corresponding increase in consumption. Perhaps the incandescent burner had not gone ahead quite as much in their district as it had in some others; but it certainly influenced matters. All the expenditure out of revenue that he had enumerated, accounted for the fact that they had not actually earned their dividend. So much for the financial affairs of the Company. With regard to the consumption, it must be remembered that they had lately had a very large "addition to their family"—he referred to the Franco-British Exhibition. Of course, electricity had the greater show there; but gas had a very good look-in indeed. Only that day, the Company had had an application for a big supply of gas for power. The shareholders would notice from the report that the decision against the Company at the Acton Petty Sessions with regard to the illuminating power of their gas, was in due course carried on appeal to the High Court, where the decision was quashed, with costs. This might not to the proprietors seem very important; but in reality it was so. They would recollect that the Company were prosecuted for deficiency in illuminating power; and the Brentford Magistrates decided against them, and inflicted upon them a heavy fine, with costs. The Company said they would appeal against this, because they suffered from an exceedingly complicated Act of Parliament, and it was very difficult to say what their burner for testing should be. The Company held one view, and the Acton authorities held another. The Acton Bench allowed the Company to state a case, and agreed to this case—which he might say was really admirably stated. He thought the effect of it being so stated was largely due to the assistance rendered in the matter by one of the Directors—Mr. R. J. N. Neville. The case was taken into Court; and three strong Judges decided in the Company's favour, and quashed the conviction, with costs. Of course, all along the Company proposed to act up to their obligations; but at the same time they wanted to have defined what the burner was that they should use. This decision had, in point of fact, saved them going to Parliament (which would have been very expensive), because it was absolutely necessary that they should have clearly laid down what burner they should work with; and now they had it. With regard to the District Council, very often a good fight, such as they had had, cleared the air to a certain extent, providing the combatants would only shake hands after it; and this was their attitude towards the Council. Nothing in the world was gained by a public body and a large industry in their midst being at loggerheads. The Council's interests and those of the Company were the same. The Company desired to have a well served and contented lot of consumers; and the Council wanted the same. At the last meeting he said, he thought, that the Board were preparing a superannuation scheme for the officers; and it might be desirable to allocate a certain sum, when they were sufficiently affluent to do it, so as to put such a scheme fairly on its legs. The Company were admirably served by their officers; and, of course, they would take good care of them, if incapacitated by age or sickness. At the same time, the Board felt that the Company needed to know where they stood; and it was also only fair that the officers should know where they stood. Therefore it was hoped that such a scheme might be settled, though it was not quite in order yet. At all events, the younger officers who joined the Company would then know how they stood, because it was proposed that they should contribute to a certain extent—which would be only fair. They would then have a claim upon the Company for a certain pension; and this seemed the best way of doing it. He thought it was very possible—though he did not care to commit his colleagues, because they had not yet fixed upon anything—that later on they might take in hand such a scheme for the workmen too; but such was the tangle of the Old Age Pension scheme at present, that companies would have to be very careful what they did until the Government made up its mind a little more, and they knew where they stood. He concluded by moving the adoption of the report and accounts.

Mr. H. C. WARD seconded the resolution, which he remarked it had been his pleasure and privilege to move on many occasions in past

years. The most satisfactory feature of the accounts, it seemed to him, was the result of writing off depreciation as they had done. Turning to the capital account, it would be seen that they had during the half year spent £22,285; but, at the same time, they had written off no less than £16,282, which meant that the capital had only been increased by £6003, instead of to the extent of £22,285, as it might have been.

Mr. A. B. BOSHER said that he was sure the few shareholders present had listened with great pleasure to the Chairman's interesting and instructive speech on the affairs of the Company. As an old shareholder, he had taken the trouble to look through a large number of half-yearly reports; and he was bound to say he did not think there was any he had seen that would compare with the present one, as regarded satisfaction for the present and promise for the future. The shareholders ought to feel grateful to the Board for the unremitting attention they must give to an intricate business like that. They were also indebted to the staff—their intelligent and energetic Engineer (Mr. A. A. Johnston), their worthy Secretary, and the rest of the executive officers. One item which had struck him as being rather remarkable was the cost of purification, which the Engineer had been able to reduce by nearly £800—from £1714 to £968. This, he thought, spoke volumes for the efficiency of the present management. Another item he would like to dwell upon for a few moments was that of rates and taxes. He noticed that the Board had been able to get this down by about £213, as compared with the same period of last year. Of course, they must be thankful for small mercies; but he happened to be a shareholder in some railway companies who had got their assessments reduced considerably.

The CHAIRMAN: It is very expensive.

Mr. BOSHER (continuing) said he knew perfectly well that the assessments of railway and gas companies were not quite on all-fours; but the rates and taxes made a large item, and he hoped it would not escape the attention of the Board. The fact that a reduction had already taken place showed that it was not doing so. His feeling with regard to the future of the Company was more optimistic than ever; and he had recently increased his holding considerably on account of this feeling.

The CHAIRMAN said that with regard to purification, of course, they were aware that the Company had been released from the obligation to purify by lime. He did not think that the gas world had quite made up its mind how far it was advisable to go in reducing the lime. There had been complaints here and there of too much sulphur. Though they themselves had reduced the lime purification, they could not altogether give it up. The assessment of gas companies had always been an exceedingly complicated affair. They were always hoping that the day would come when the system would be put on a more satisfactory basis; but the time had not arrived yet. The Company did not spend a penny unnecessarily; but they had had to spend a good many pennies in developing the business, and it was highly probable that they would have to go on spending them for a year or two more. But that they would reap the advantage of this outlay, no member of the Board had the slightest doubt. He did not think they would be justified—and he was sure this was also the view of the shareholders—in flinching from spending money where it seemed to the Directors necessary that it should be spent.

The resolution was then carried unanimously.

On the proposition of the CHAIRMAN, seconded by Mr. WARD, dividends were declared for the half year to June 30 at the rate of 5 per cent. per annum on the 5 per cent. preference stock, 12½ per cent. per annum on the consolidated stock, and 9½ per cent. per annum on the new stock, 1881—subject to income-tax.

Mr. BOSHER proposed a hearty vote of thanks to the Board and the executive staff for their services during the past half year. He thought the suggestion of a superannuation fund was a very honest and straightforward way of dealing with the question of Capital and Labour; and they should all approve of it strongly.

Mr. T. WILKINS seconded the proposal, which was cordially agreed to.

A brief acknowledgment by the CHAIRMAN concluded the proceedings.

WEST HAM GAS COMPANY.

The Half-Yearly Report and Accounts.

In the report to be presented at the half-yearly meeting of the West Ham Gas Company on Thursday, the Directors state that the profit balance (including £20,816 brought forward) for the six months ending the 30th of June amounts to £51,234; and they recommend a dividend of 5 per cent. per annum on the preference stock, of £5 2s. 6d. per cent. per annum on the consolidated ordinary stock, and the addition of £528 to the reserve fund. These payments will absorb £26,829, and leave a balance of £24,405 to be carried forward. In view of this satisfactory position, the Directors have decided to reduce the price of gas by 1d. per 1000 cubic feet—viz., to 2s. 8d.—as from Michaelmas next. The applications for prepayment supplies are still being received in considerable numbers; 3807 new demands having been met during the period covered by the report. The total number of prepayment installations on the 30th of June was 41,578. The accounts accompanying the report show that the total revenue in the first half of the year was £160,071, compared with £146,332 in the corresponding six months of 1907; the expenditure being £124,230, against £114,395. The statements as to manufacture show that 54,083 tons of coal and 834,901 gallons of oil were used in the production of 912,612,000 cubic feet of gas, of which 867,810,000 cubic feet were sold and 877,849,000 cubic feet accounted for. The residuals produced in the half year were: Coke, 29,033 tons; breeze, 5890 tons; tar, 609,331 gallons; sulphate of ammonia, 544 tons.

Paris in Darkness.—As the result, it is stated, of a carefully organized demonstration, a general strike of electric light workers took place in Paris last Thursday night, and the Place de la Bourse and other parts of the city were plunged in darkness. The strikers returned to their duties at ten o'clock, and a few minutes later the light was restored.

CAMBRIDGE GAS COMPANY.

New Offices and Show-Rooms—Asylum Lighting Question.

The Half-Yearly Meeting of the Cambridge Gas Company was held last Tuesday—Mr. W. B. REDFERN, the Vice-Chairman, presiding.

The SECRETARY (Mr. A. E. King) having read the notice convening the meeting,

The report of the Directors was presented. They stated therein that the slightly better terms which they had obtained for the year's supply of coal had enabled them to reduce the price of gas to 2s. 9d. per 1000 cubic feet. It was satisfactory to record that this was the lowest price which gas for lighting purposes had ever touched in Cambridge. The Company had purchased freehold premises in Sidney Street, and would take possession at Michaelmas next. The increased accommodation would provide more convenient offices for the clerical staff, and would also give the Company larger show-rooms and workshops. The great variety of cooking and heating stoves, burners, and fittings now in vogue rendered a larger show-room very useful. The Company's capital had during the past half year been increased by the sale of £3000 of "C" stock, at a very satisfactory price. The accounts accompanying the report showed a sum of £21,683 available for distribution; and the Directors recommended the payment of the maximum dividends.

The CHAIRMAN, in moving the adoption of the report, expressed the satisfaction of the Directors at being able again to recommend that the maximum dividends should be paid, and also to reduce the price of gas to 2s. 9d. per 1000 cubic feet—the lowest figure which had ever been reached in the borough. The next item in the report related to the purchase of new premises, which they hoped to occupy very shortly, in Sidney Street. The reason for taking them was patent. The Company were increasing their business to such an extent that they required better show-rooms in order to exhibit the newly-introduced gas accessories. By having the new premises, they would be able to bring before the public what they were at present unable to show them. During the past year they had established a set of "first aid" classes for their workmen. Out of 36 who entered, 34 passed very creditably; and medals and certificates were recently issued to them. The Company had also improved their works very materially; and, thanks to Mr. Auchterlonie (the Engineer and Manager), whose efficiency, they knew, was very great, their works were being brought quite up to date. In the course of a year or two, he thought they would be able to show as good works as were to be found in any provincial town in the kingdom. Their Auditor (Mr. Tansley Witt, F.C.A.) had complimented them on the way in which their books were kept under the management of the Accountant (Mr. G. W. Lawson); and, altogether, he thought their reports were very satisfactory.

Mr. STANDLEY seconded the motion; and it was carried.

The dividends recommended were then declared; Mr. Redfern was re-elected a Director and Mr. Tansley Witt re-appointed Auditor.

Mr. REDFERN, in returning thanks for his re-election, said he ought to add one or two remarks with reference to the sale of gas. During the past half year the proceeds had exceeded those of the corresponding period of last year by about £1000; and the public lighting had also increased somewhat. He was happy to say that as each year went by they were finding a reduction in the leakage, which had always been a sore point with them. This was certainly a step in the right direction. Referring to the lighting of Fulbourn Asylum, he said there had been a good deal of correspondence and discussion on the subject, and he would ask Mr. Peace to say something on this point.

Mr. J. B. PEACE (a Director) then read the following statement:—

It is desirable, in the interests of the Company and of gas lighting as a whole, that some notice should be taken of the report lately published on the lighting of the Fulbourn Asylum. There are two points in the comparison between gas lighting and electric lighting to which attention ought to be drawn.

(1) The report gives an estimate of cost of the two systems of lighting on the assumption that 12,000 units of electricity will give the same amount of light as 3 million cubic feet of gas. The fact is that, with the efficiency stated in the report, 12,000 units of electricity will supply 9,600,000-candle power for an hour; whereas the 3 million cubic feet of gas, on a very moderate estimate of efficiency with incandescent burners, will give 45 million candle power for an hour, or nearly five times as much. Further, the carrying capacity of the main proposed for the electric light scheme is enough to maintain a maximum of 16,000 candles; whereas that of the Gas Company's scheme would maintain 80,000 candles. These figures show that the comparison has been made between schemes which were not in any way comparable.

(2) The figures of the Gas Company as they appear suggest that the minimum supply of 3 million cubic feet per annum is insisted on by us. While it is right that some minimum return should be guaranteed in a case which requires considerable extension of mains and other preparations, the actual minimum stated in our proposals was not based on our estimate of the needs of the Asylum, but on an estimate of a minimum consumption of gas furnished us by the expert.

The Company have no wish to quarrel with their neighbours the Electric Light Supply Company, and in ordinary circumstances the Directors would not take any public notice of the question of settlement of any contract for which they have tendered. In this matter, however, which on one side is of importance to the ratepayers of the district, and on another side is of importance to the industry of gas lighting, they have thought it well to give to the shareholders some explanation of the apparent discrepancy between the figures published and the ordinarily accepted figures of comparative cost of the two systems of lighting.

In reply to a question, Mr. PEACE stated that the Visitors of the Asylum had decided in favour of the electric lighting scheme. He added that the matter had been taken up by people interested in gas, as the comparison was too misleading to be allowed to stand.

A vote of thanks was then passed to the Chairman, Directors, and staff, and the proceedings closed.

Cowfold Lodge, near Horsham, the residence of Mr. Arthur Labouchere, was completely destroyed by fire early last Friday morning. The outbreak is attributed to an explosion of acetylene gas.

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TOTTENHAM AND EDMONTON GASLIGHT AND COKE COMPANY.

Co-Partnership to be Introduced—Adoption of Vertical Retorts Foreshadowed—Further Reduction in Price in Prospect.

The Annual General Meeting of the Company was held last Saturday, at the Works, Willoughby Lane, Tottenham—the CHAIRMAN (Mr. Corbet Woodall) presiding.

The SECRETARY (Mr. E. Topley) read the notice calling the meeting; and the report and accounts were taken as read.

The CHAIRMAN, in moving their adoption, said his observations on this occasion would be few. They had assembled at the works rather than at the offices, in order that the proprietors might have an opportunity of inspecting the alterations and improvements that had been made in the works during the past year. The Board were continually asking for considerable sums of money from the proprietors; and he thought it was in every way desirable there should be these visits from time to time, in order that the proprietors might see what had been done with the capital they had subscribed. He thought that nothing but good could result from the visits, because his own impression was that the proprietors who inspected the works would come to the conclusion that their money had been well and profitably spent. It was only three years ago that their last retort-house was built. It was large enough for a production of rather over 3½ million cubic feet of gas daily; but, at the outset, only one-half the retorts were set, capable of producing about 1¾ million cubic feet of gas a day. These retorts were already fully occupied; and the proprietors would see, when inspecting the house, that the second battery of retorts was in process of erection, and would be completed ready for next winter's demands. Personally, he had little doubt that when next year came, their Engineer would be gently but firmly intimating to the Directors that the time had come when they would have to think about building another retort-house. And so—not simply in this one direction, but all through the works, and in the district—with a business growing as this Company's was, capital expenditure was absolutely essential from year to year. He did not think they had any reason at all to complain—certainly he (the Chairman) did not grumble—at having this large expenditure to meet. He knew of a good many companies who would like to have a very large share of their complaint, and without any disposition to find fault. What he wanted the proprietors to understand was that, so long as the business progressed as it was doing, so long must there be capital provided to meet it. One thing they had to be very careful of; and this was that the outlay did not grow at a greater rate than the business, and that they had full worth for the money spent. It was not at all improbable that their next expenditure on carbonizing plant would be on lines somewhat different from those hitherto followed. Many developments had of late taken place; and improvements were being made. And it was hoped that, before the Company began building carbonizing plant again, they would be able to determine between the systems as to which would be the most economical for them to adopt. Reverting to the rate at which capital was expended, it was of interest to note that ten years ago the expended capital of the Company was £288,000; and the quantity of gas sold was 475 million cubic feet. In the year to June last, the quantity of gas sold had risen to 1333 million cubic feet; and the expended capital was £594,000. These figures respectively represented £602 and £445 per million cubic feet. It would therefore be seen that, with the large expenditure the Company had been incurring, the proportion of capital to business done had been reduced by nearly 33 per cent. This was as it should be; and so long as the burden of capital was a reducing one, they might be pretty certain the charge for gas would be travelling in the same direction. Ten years ago the dividend on the "B" stock was at the rate of 4½ per cent.; and the total charge for dividend and interest amounted to 10d. per 1000 cubic feet. To-day, the dividend was 5¼ per cent., and the charge was reduced to 6¼d. per 1000 cubic feet. So that, with a higher dividend, they had to charge against the consumer nearly 4d. per 1000 cubic feet less than ten years ago. It was easy to understand, with these figures before them, how the price to the consumers had come down in the period from 3s. to 2s. 6d. per 1000 cubic feet. The half year just closed had been a trying one. The price of coal was 40 per cent. higher than in June, 1906, and 25 per cent. higher than it was in the corresponding half of last year. The bad times had, however, passed; and although they had not quite earned their dividend in the past half year, they were carrying forward only about £500 less than the amount brought into the account at Christmas. The proprietors would probably have noticed the large increase in the item of rates. This was accounted for partly by an increase in the assessment to which he referred at the last meeting, and partly to the fact that the whole increase for the year was charged in these accounts, and not simply one-half. The advance in the sales of gas had been above 10 per cent.; and there was every prospect of some such rate being maintained. Because the Directors counted upon this, and because they were determined to do the best to assure it, they had practically decided, unless something unforeseen happened, that the price of gas should be again reduced at the end of this year. Although he was anxious to bring his remarks to a close, and let the proprietors go about what was practically the business of the day—that was, the inspection of the works—there was one other particularly interesting matter to which he desired to call attention, and upon which he hoped to have an expression of opinion. The Directors had decided to modify the relations between the employees and the Company by introducing a system of profit-sharing. He had repeatedly expressed from the chair the great satisfaction which the Directors, guided by their own observations and the report of the chief officers, had felt with the conduct and zeal, and the thoroughness of the work, of both the official staff and of the workmen. There had been perfect harmony, and, the Directors believed, content with the terms of service. The rates of salaries and wages, while not, he hoped, extravagant, had been well up to the standard established for similar services both in the neighbourhood and elsewhere. In proposing an important modification in the method of remunerating the Company's servants, therefore, the Board were actuated by no discontent with the service rendered, nor were they moved by any, even the smallest, evidence of dissatisfaction on the part of the staff. In deciding to adopt a system of profit-sharing, they were moved by a desire to improve the outlook of the men, to give them an added zest in their work, and to establish a relationship between them and the Company which would maintain, and possibly even improve, the relations at present subsisting. The new system was intended to meet the difficulty which working men found in saving out of their weekly wages and to create the interest in the undertaking which attached to the idea of co-partnership. The share of profit to be paid to the employees would be calculated upon a sliding-scale governed by the price of gas. As with the consumers who benefited directly by a reduction in price, and the shareholders whose dividends were increased from the same cause, so would the income of the men be benefited. The Board proposed to adopt for this purpose a standard price of 3s. per 1000 cubic feet. For every penny by which the price was reduced below 3s., there would be added to salaries and wages ¾ per cent. As they were now charging 2s. 6d., the addition to pay would be six times ¾ per cent., or 4½ per cent.; and this represented, on the present wages, £2115 per annum. As a send-off to the new scheme, it was proposed to ante-date it by three years, giving each man a sum equal to what he would have had had the plan been adopted three years ago. This bonus amounted to £4038, and must all be invested in stock of the Company. The yearly share of each man must also as to one-half of the amount be similarly invested; the remainder would be at his disposition to invest or not as he chose. The scheme, as the proprietors were aware, was not an experiment. It had been tried by several companies whose testimony was strongly favourable; and the Board confidently hoped for the good results to which he had already referred. In no sense would the plan interfere with the control or the discipline of the staff. This, as he said, was an important departure in the policy and history of the Company; and so he should be very glad to have any observations from the shareholders upon it. That it would operate largely to raise the status and improve the outlook of the men, he was quite convinced; and he thought the Company would also benefit, because of the greater thoroughness and devotion of the men in their work. There was always a margin of wasted time to be drawn upon; and the men would be keener in picking up this waste when they felt their interests were bound up in the prosperity of the Company.

Mr. HENRY BAILEY seconded the motion; and, in doing so, expressed his hearty concurrence in the new scheme.

Mr. OSBORN asked what would be the position of the men on leaving the works.

Mr. DANIEL MOORE remarked that he was pleased to hear something was being done for the workmen; and he hoped they would appreciate it. He would, however, like to ask whether the workmen were contributing in any way, and whether they were showing their interest in the affair. He saw many older men than himself present; and some of them had seen three score years and ten. They could go back to the time when (say), fifty years ago, they would have seized hold of such a thing as was now proposed with great pleasure. He knew a few present who had had to put their shoulders to the wheel, who had been strenuous workers, and who had succeeded; and he trusted that, while they all liked to encourage the workmen, that they too would put their shoulders to the wheel, and work as their forefathers had done.

Other questions asked were whether the idea was precisely the same as the system of the South Metropolitan Company; why the Directors proposed to ante-date the scheme by three years; and whether the £4000 odd that the ante-dating would require was provided for.

The CHAIRMAN replied that the scheme, while modelled on the same lines as the South Metropolitan Company's, was not precisely similar. As to the point regarding a man leaving their service, his interest in the profit-sharing scheme would be calculated right up to the date of leaving, assuming, of course, that he left under creditable circumstances. They were obliged to the gentleman who spoke as to the experiences of their forefathers in regard to the strenuous life. He thought most of them were disposed to fancy that they had worked harder than their sons were willing to do; but he had a suspicion that their fathers thought the same of them. He did not think, however, they should look back to the relations subsisting fifty years ago between employers and men for their guide in the conduct of affairs now. A good deal had happened during this fifty years; and when they considered how difficult it was for men to put by out of a weekly wage any proportion of it for the day when they could work no longer, he thought they would at heart be all very sympathetic with anything that would enable the men to make this provision in the days of their strength, before they had to give up their occupations. One proprietor asked whether the men contributed anything. In a certain sense they had to wait the result of a trial before an answer could be given to the question. What he hoped was, as he had said, that the interest that the men would feel in the undertaking in which they were partners would be so much increased that they would—should he say, consciously or unconsciously?—put more into their work, more zest, more intelligence, than they did at the present time. So far as the system stimulated in this direction, so it would be found the men were contributing to the savings of costs. The plan was the one that had been honourably identified with the South Metropolitan Gas Company, and its Chairman; but in some respects the Board of the Tottenham Company were not disposed to live quite up to the standard set by their friends. It was not the intention to invite Workmen Directors on the Board. There was a question asked with regard to the raising of the money for the three years' payment with which the scheme was to be started. The proprietors had only to look at the accounts, and a sufficient answer would be found there. The reason the Board proposed to ante-date the scheme was that they wished the men to accept it as an assurance of the goodwill of the proprietors and the Directors. They wanted them to take it up with zeal and earnestness; and they wanted to give them, at as early a date as possible, money enough in hand to have some small holding in the Company's stock. For the three years, the bonus would represent about £4000; and the whole of

this must be invested in the Company's stock. Whether the amount individually received was large or small, it would at once go in the purchase of stock; and when each individual had an amount equal to or exceeding £5, then there would be bought for him a proportionate amount of stock. It was a fact that if a man had a few shillings paid to him he did not regard it nearly so seriously as it was desired the men should do under this scheme, by using the money for the acquisition of dividend-earning stock. This ante-dating by three years was really to give the scheme a send-off; and to attract the concurrence and hearty goodwill of those whom it was intended to benefit. The three years' bonus would go into stock, with half of the yearly increment, and, as to the other half, every possible inducement would be given the men to invest the whole. Judging from the experience of their friends in South London, the probability was that very nearly the whole would go into stock. Further than this, the Directors wished to encourage the men to bring their own savings from other sources, and invest more in the concern than the amount coming to them under the scheme.

The motion was unanimously carried.

Mr. JAMES CLOUDSLEY moved the declaration of dividends at the rate of 6¾ per cent. per annum on the "A" stock, and 5¼ per cent. per annum on the "B" stock, both less income-tax.

Mr. W. B. RANDALL, in seconding, observed how pleased he was that the Directors had been so long-sighted as to introduce this question of co-partnership, which would unite the interests of the workers more closely with those of the undertaking, and would help to reduce the price of gas and to increase the dividends.

CO-PARTNERSHIP APPROVED.

Mr. JAMES RANDALL proposed—"That this meeting, having heard the statement of the Chairman, expresses its hearty approval of the scheme of profit-sharing proposed to be adopted, and wishes it great success." He said he would prefer, for the moment, to drop his position of junior Director, and to speak as an old servant of the Company dating from the year 1851. He fully understood, from long experience, the difficulty of the working man, however firm his views, to carry out the plans for thrift. Those who had mixed with workmen in a gas-works knew how soon good resolutions melted into the air. The claims of the wives and children naturally stood first. From time to time, the Directors, past and present, had offered opportunities to cultivate habits of thrift. A savings bank was established in 1890; but while it had been very commendably supported, yet at holiday seasons it was considerably depleted by the men, in order to enable them to take their wives and children for a holiday. Other claims, too, came along; so that the difficulties were great to save such a sum of money as would enable the men to purchase shares in the Company. It had been the constant endeavour of the Directors to cement good-fellowship and loyal service between employer and employed at all times; and the Company could proudly boast that no workmen had been in receipt of parochial relief from the poor rate for the long period dating from the inception of the Company. The young men of to-day, before they began to get grey-haired, would be able to participate in the division of profits to which they so loyally contributed by honest labour, and would be able to point to their children the example set by the proprietors and the Directors in creating a nest-egg, to start each man as a proprietor of stock. Then, when the time came for retirement from labour, with a substantial sum standing to his credit in the books of the Company, every man would be enabled, with his better half, to enjoy the fruits of his labour—the honestly earned reward of his toil. Every man would become, in every sense, a better citizen and a better husband and father. It would be idle to prophesy the future; but there was not the shadow of a doubt that the more the executive tried to bridge the gulf between employers and employed, the greater the civilizing influence would be felt for good in every respect. The Directors confidently looked to those in the home to use their influence to assist in making a success of the grand principles of co-partnership.

Mr. GEORGE ROWE seconded the motion.

The CHAIRMAN, in putting it, said there had not been a trace or tittle of agitation among the men. It might be wondered why the Board were taking this step at a time when there was such perfect harmony and agreement between the men and the Board and officers. It was because of this, because they had had a long period during which their relations had been so good, that the Directors felt the time opportune when they could, without question as to motive, invite the men to take a closer interest in the undertaking that gave them employment.

The motion was carried unanimously.

Mr. G. T. WATSON moved the re-election of Mr. Corbet Woodall as a Director. Of Mr. Woodall's qualifications, he said he need not speak. Under his chairmanship, the Company had attained a degree of prosperity which must be gratifying to all the shareholders.

Mr. E. SAWYER seconded the motion, which was heartily passed.

The CHAIRMAN, having acknowledged the confidence of the proprietors, moved that Sir Daniel F. Goddard be re-elected.

Mr. J. L. CHAPMAN seconded the motion, which was also cordially agreed to.

On the proposition of Dr. SCOTT, seconded by Mr. OSBORN, Mr. Chapman was re-appointed one of the Auditors.

Moved by Mr. EVE, and seconded by Mr. SOUTTER, a vote of thanks was passed to the Chairman and his colleagues; and, on the proposal of the CHAIRMAN, seconded by Mr. W. WOODWARD, the Engineer and Manager (Mr. A. E. Broadberry), the Secretary (Mr. E. Topley), their staffs, and the workmen, were heartily thanked for their devoted services.

Acknowledgment of the vote by Mr. Broadberry and Mr. Topley concluded the proceedings.

Suicide by Inhaling Gas.—A verdict of "Suicide while of unsound mind" was returned in the case of a St. Helens joiner named Kay, who was found in his kitchen sitting by the side of the table with his head resting on his hands. A rubber tube, which was fastened to the gas-bracket above his head, was in his hand, and had evidently been inserted in his mouth. He was quite dead, and had been so for some time. The gas was turned on; but being a slot meter, the supply available had all escaped. It was stated that deceased was a heavy drinker, and had lately been strange in his manner.

COMMERCIAL GAS COMPANY.

The Half-Yearly Report and Accounts.

The following is the report that the Directors of the Commercial Gas Company will present at the half-yearly meeting on Thursday.

The revenue account shows a net profit for the half year of £54,974 14s. 9d., which, added to the balance of £25,837 19s. brought forward from last year, produces a net revenue balance of £80,812 13s. 9d. Deducting therefrom £9498 16s. 3d. for interest and stamp duty, there remains standing to the credit of the net revenue account a balance of £71,313 17s. 6d. available for dividend. The Directors recommend the payment of dividends at the rates of £5 4s. per cent. per annum on the 4 per cent. stock of the Company, and of £5 per cent. per annum upon the 3½ per cent. stock, both less income-tax. The balance of the net revenue will be carried forward to the next half year.

The accounts accompanying the report consist of the usual set of statements. They show that the paid-up stock on the 30th of June amounted to £976,405; that £1,076,875 had been added by conversion, making £2,053,280; and that £170,698 remained unissued out of the total authorized capital (including premiums) of £2,235,000. The total amount borrowed on the above-named date was £339,062 10s., and £135,937 10s. was added by conversion; making a total of £475,000, and leaving £79,226 to be borrowed out of the £550,000 authorized. The receipts on capital account amount, with premiums, to £2,584,665 4s. 5d. The expenditure stands at £1,419,214 5s. 9d., with a nominal amount of £1,212,812 10s. added by conversion—together £2,632,026 15s. 9d. There is consequently a balance of £47,361 11s. 4d. carried to the balance-sheet. The expenditure on capital account in the half year was £11,091, apportioned as follows: New and additional buildings, plant, &c., £1518; new and additional mains, services, &c., £2826; stoves, £3565; prepayment meters and fittings, £3182. The reserve fund amounted at the close of June to £35,274; and the insurance fund to £33,609. The following is the revenue account:—

Expenditure.

Manufacture of gas—		
Coal and oil, including dues, carriage, unloading, and trimming	£108,662 15 0	
Salaries of Engineer and officers at works	2,428 11 7	
Wages (carbonizing)	16,639 7 4	
Purification, including labour	1,316 10 3	
Repair and maintenance of works and plant, materials and labour, less £121 8s. 3d. received for old materials	23,213 14 2	
		£152,320 19 4
Profit sharing		2,790 2 0
Distribution of gas—		
Salaries and wages of officers (including rental clerks)	£3,969 16 5	
Repair, maintenance, and renewal of mains and services, material and labour	6,910 19 6	
Repair and renewal of meters	2,465 16 9	
" " " " stoves	7,121 17 7	
" " " " prepayment meters and fittings	8,728 16 8	
Incandescent mantle maintenance	477 8 2	
		29,674 15 1
Public lamps—lighting and repairing		2,562 2 7
Rent, rates, and taxes		12,366 17 0
Management—		
Directors' allowance	£1,250 0 0	
Company's Auditors	75 0 0	
Salaries of Secretary, Accountant, and clerks	1,250 1 5	
Collectors' salaries and commission	1,716 10 7	
Prepayment meter collection	2,615 9 3	
Stationery and printing	1,089 8 10	
General charges	1,629 9 9	
		9,625 19 11
Bad debts		941 8 9
Law and parliamentary charges		178 8 9
Superannuations and allowances		992 4 6
Official officers, &c.		143 14 11
Total expenditure		£211,596 12 10
Balance carried to net revenue account		54,974 14 9
		£266,571 7 7

Receipts.

Sale of gas—		
Common gas per meter at 2s. 6d. per 1000 cubic feet (88,525)	£188,962 5 11	
Public lighting and under contracts, common gas	5,796 18 8	
	£194,759 4 7	
Less discounts and allowances	3,819 9 4	
		£150,939 15 3
Rental—		
Meters (23,644)	£2,857 18 0	
Stoves (53,451)	8,460 13 5	
Prepayment meters (64,501)	10,814 14 7	
Incandescent mantle maintenance	493 19 6	
		22,627 5 6
Residual products—		
Coke, less £4037 16s. 11d. for labour	£34,709 15 7	
Breeze, less £1008 1s. 3d. for labour	3,111 15 9	
Tar	5,600 6 9	
Ammoniacal liquor and sulphate of ammonia	9,450 1 9	
		52,911 19 10
Miscellaneous receipts—		
Rent receivable	£53 12 0	
Transfer fees	38 15 0	
		92 7 0
Total receipts		£266,571 7 7

The following are the statements relating to the manufacturing operations of the Company in the half year:—

Statement of Coals and Oil.

Description of Coal.	In Store Dec. 31, 1907.	Received During Half Year.	Carbonized During Half Year.	Used and Sold During Half Year.	In Store June 30, 1908.
	Tons.	Tons. cwt.	Tons.	Tons. cwt.	Tons.
Common	24,691	102,990 10	99,424	544 10	27,713
Cannel	1,142	..	620	..	522
Total	25,833	102,990 10	100,044	544 10	28,235
Oil—gallons	342,674	1,179,942	1,280,699	..	241,917

Statement of Residual Products.

Description.	In Store Dec. 31, 1907.	Made During Half Year.	Used During Half Year.	Sold During Half Year.	In Store June 30, 1908.
Coke—tons	7,226	61,277	14,431	48,823	5,249
Breeze—tons.	3,788	14,386	..	12,515	5,659
Tar—gallons	784,182	1,338,151	..	1,526,808	595,525
Ammoniacal liquor—butts	5,394	31,098	30,039	..	6,453
Sulphate of ammonia—tons	135	931	..	971	95

Statement of Gas Made, Sold, &c.

Quantity Made (meter register and estimated).	Quantity Sold.		Quantity Accounted for.	Number of Public Lights.
	Public Lights and under Contracts (estimated).	Private Lights, per Meter.		
Thousands.	Thousands.	Thousands.	Thousands.	
1,669,103	37,396	1,514,346	1,576,778	3997

The remaining statement is the balance-sheet, which gives the value of the stores in hand at the close of the half year as follows: Coal, oil, &c., £25,534; coke and breeze, £4503; tar, ammoniacal liquor, sulphate of ammonia, &c., £7173; sundry stores, £34,996—total, £72,207. The figures this time last year were: Coal, oil, &c., £17,026; coke and breeze, £1886; tar, ammoniacal liquor, sulphate of ammonia, &c., £7842; sundry stores, £33,144—total, £59,898. A sum of £15,856 stands in the balance-sheet as employees' bonus and savings, compared with £20,443 at the end of June, 1907.

YORK UNITED GAS COMPANY.

The Half-Yearly General Meeting of this Company was held last Thursday—Mr. J. R. Hill, J.P., in the chair.

The Secretary and Manager (Mr. J. H. Hill) read the Directors' report, in which it was stated that the balance of the profit and loss account for the six months to June 30 amounted to £10,229, and that a sum of £9605 was available for distribution. They recommended the payment of dividends at the rate of 4 per cent. per annum (less income-tax) on the preference and ordinary stocks, and the transfer of £1000 to the reserve; leaving £625 to be carried forward. There was an increase of more than 6¾ million cubic feet in the quantity of gas sold by meter, compared with the first half of last year; and during the past six months 1689 yards of additional mains had been laid, 206 meters put in for new customers, and 473 cookers, 196 gas fires and boilers, and 1723 extra lights fixed.

The Chairman, in moving the adoption of the report and accounts, remarked that there was little to say in the way of explanation of the result of the half-year's operations as presented to the proprietors. The Company had discharged their duty to the consumers by providing them with excellent articles for lighting, heating, cooking, and trade purposes; and they had done it at charges which were among the lowest in the United Kingdom. The financial result was that they were able to pay their usual dividend, invest £1000 as part of the reserve fund, and carry forward £625. The report gave figures which showed that the quantity of gas sold continued to grow, and that there was expansion in the Company's business. They had, as usual, maintained their gas making and distributing plant in efficient working order. Since the last meeting, the renewal of six beds of retorts had been completed, and they were just commencing another section of three beds. The Local Government Board recently held an inquiry into the borrowing powers of the Corporation in respect of electricity; and in the course of it their Inspector asked for information as to the cost of the public lighting. The Directors thought it desirable that the Company, as large ratepayers and also as suppliers of gaslight, should be officially represented; and it was prominently brought out that the cost to the ratepayers of the electric lighting was very considerably more than that of the displaced gas. Wherever an impartial judgment could be brought to bear upon the merits of the two illuminants, it was conceded that gas was much more efficient and suitable for street lighting than electricity; and the ratepayers of the city should realize that they were being made to pay a higher price for an inferior article by the change which had been made in the mode of lighting some of the streets.

Mr. J. Melrose seconded the motion; and it was carried unanimously.

The dividends recommended having been declared,

Major Lindberg proposed a vote of thanks to the Directors for the efficient manner in which they had conducted the business of the Company. With regard to the inquiry by the Local Government Board, referred to by the Chairman, he thought it was an admirable move on the part of the Directors to obtain the representation of the Company. It brought out the fact that gas lighting in the city was not only better, but more economical than electric lighting.

The vote having been heartily accorded, the thanks of the meeting were conveyed to the staff; and the proceedings terminated.

Burnley Gas-Works Extensions.—A Local Government Board inquiry has been held at Burnley respecting an application by the Corporation to borrow £13,000 for the purposes of the gas undertaking—£10,000 being for mains, and £3000 for stoves. The Town Clerk (Mr. P. Thomas) said the extension of the gas-mains during the next few years was likely to be heavy, owing to the increase in the number of mills and the growth of building operations. Moreover, the Corporation were about to provide a supply of gas to Cliviger; and the estimated cost of the mains to the village was £2170.

EAST SUSSEX GAS AND WATER COMPANY, LIMITED.

Financial Position.

The accounts of this Company, covering the period from October, 1905, to the end of March, were issued a short time ago; and they were commented upon last week as follows in the "Daily Mail," under the heading "An Eatonesque Company."

For those who may be tempted to subscribe to any of the group of gas and water companies of which Mr. Edmund Eaton is the moving spirit . . . there is matter of interest in the report and accounts of the East Sussex Gaslight, Coke, and Water Company, another of the group. The accounts cover the period from October, 1905, to the end of last March; so that the shareholders do not get very frequent information. The water-works were open for supply in April, 1907, and the gas-works, as the report states, "about" August, 1907. Even allowing for the fact that the Company is thus in its initial stages, the revenue account shows some remarkable proportions. On the debit side, the principal items are: Coals, £239; Directors' fees, £248; salaries, £268; stationery and printing, travelling, general management, and miscellaneous expenses, £263. These and other items on the debit side make a total of £1300; while the receipts amount to only £257, of which £239 is for gas and water sales. There is thus a debit balance of £1043. Added to "discount on shares and debentures," £31, and debenture interest to March 31, £1163, this makes a total loss to date of £2237. Moreover, preliminary expenses figure in the balance-sheet at £4773. Considering that there are debentures to the amount of £10,000, and the share capital is no more than £15,180, these items on the wrong side are rather alarming, even if we give due weight to the statement that "the Directors have every reason to believe that the shareholders will be well satisfied with the steady growth of the business and the substantial increase in revenue which will be shown in the next balance-sheet."

A Report of the Meeting.

[From the "Financial News," Aug. 4.]

The Annual Meeting of the Shareholders of the East Sussex Gaslight, Coke, and Water Company, Limited, was held on Saturday, at the works of the Company at Heathfield, Sussex. Dr. Allan Maclean presided, and the other Director present was Mr. Edmund Eaton, C.E. Mr. Alfred Schofield, the third Director, was absent, owing to ill-health. There were seven shareholders in attendance.

The Chairman submitted the report without comment.

Mr. Eaton made a statement with reference to the position of the Company. He said he thought there was not much to add to what the report of the Directors stated; but possibly it would be advantageous to emphasize some of the points which were mentioned. The first point was with regard to gas and water. There had been, and was at the present time, a steady increase both in the number of the consumers and in the output of water and gas. It might appear to the shareholders who had not had an opportunity of surveying the district that the possibilities of the Company as regarded growth were not so great as they might be. But if they would spend some time in going round the district, they would find that buildings were going up, that plans were out for new houses, and that there was every prospect of a very large increase in the ultimate population, and therefore in the output of gas and water in the district. He then came to another point in the report, and that was the proposal which had been put before the shareholders to amalgamate the undertaking with another neighbouring Company. He believed the Directors had put the advantages of that amalgamation very frankly and clearly before the shareholders. He was pleased to say that the proposals, which were entirely in the interests of the shareholders themselves, had met with very considerable support. In order, however, to carry that into effect, it was necessary that the whole of the debenture holders of that and the other Company should be brought into line, and that their consent should be obtained to the amalgamation. With reference to the observation which had been made: "Why is not the meeting held in London, and not at the works?" on behalf of the Directors, he said this—and he said it without fear of contradiction—that it was far more honest and open, rather than meet in London, that the shareholders should be called together to see exactly the district and the works on which their dividends depended, and in which they had invested their money. He knew it was the fashion to call meetings in London; but it was not the policy of the Directors to do that. They had asked the shareholders frankly to come there, to go round the district, and ask any question they liked, so that they might see where their money was invested, and what likelihood there was of any return on that investment. This was why they were called there—to see the foundation for themselves, what they had got for their money, and what the prospects were.

Mr. Grimes (a shareholder, of Chatham) said he should like to put a few questions; and he asked, Who are the Directors?

Mr. Eaton replied that they were Dr. Allan Maclean, Mr. Schofield, and himself; but Mr. Schofield was not present, owing to indisposition. Mr. Schofield was retiring, because his health hardly fitted him to be a Director.

Mr. Grimes: Then you say in the report, "The Board of Directors has been strengthened by the addition of Dr. Allan Maclean." Why do you report it? He is already on the directorate.

Mr. Eaton said it was necessary to do so, as he was not an original Director. He added that if there was any shareholder who would like to join the directorate, they would be very pleased to welcome him.

Mr. Grimes said he saw no date on the certificate of the Auditor as to the bank balances.

The Chairman said the balances were dated from March 31 last, but why the date had not been put at the bottom of the certificate he did not know.

Mr. Eaton: I think it is a mere matter of clerical omission.

Mr. Grimes: Well, I am sorry it is not in.

Mr. Eaton: Every single item of expenditure can be vouched for by the Secretary.

The Secretary: Every voucher has been seen by the Auditor.

Asked by Mr. GRIMES as to how much of the £5 shares had been called up,

The SECRETARY stated that at the date of the report only a certain proportion, as was shown by the balance-sheet, had been called.

Mr. GRIMES: I see an amount of £18,000 by concessions from the Gas and Water Works Supplies and Construction Company, &c. What is the meaning of that?

Mr. EATON replied that that £18,000 included the whole of the mains and the whole of the plant and buildings—both the water and gas plant, with the exception of the high-service reservoir. The Company were in a favourable condition as regarded the concessionnaires, who handed over rights which were statutory rights. Moreover, they handed over to the Company customers already connected up.

Mr. GRIMES said he noticed also that there was an excess over the estimate of upwards of £700 in connection with the expenses concerning the formation of the Company.

The SECRETARY said what was estimated was the preliminary expense; but there were, in addition, formation expenses, which came to nearly £300, the stamping of the agreement £100, and other items which were responsible for the £700 extra.

Mr. GRIMES said he saw in the balance-sheet £235 for "debenture interest due." He supposed this had not been paid.

The SECRETARY: Oh, yes; it was paid on April 1.

Mr. EATON: We owe no debenture interest.

Mr. GRIMES: I see there is an amount of £90 13s. for law costs. Can you explain that?

Mr. EATON said he was pleased this point had been raised. Certain Directors were appointed, and their policy was not in accordance with his policy, and consequently he resigned. The result was there was expense. They put the Company to the expense of £90 in one way or another, which the Company had to pay.

Mr. GRIMES: That is rather an unlooked-for debt—a waste of shareholders' money pure and simple.

Mr. EATON: I quite agree; and I am very glad that you raised the point. I did not agree with the policy of my predecessors, and I resigned; and in the meantime the Company was put to this expense. I strongly objected to it when it was found out, and the question of getting the money back was considered; but it was found afterwards that it was a very doubtful point to test.

Mr. GRIMES inquired if it was intended to issue the accounts yearly.

Mr. EATON replied that they were bound to do so by law.

Mr. GRIMES: We did not get them last year.

Mr. EATON said their financial year did not commence till 1907. There was a statutory meeting called. This was their first financial year, and they would hold meetings annually. He could only tell them that since the closing of the account there had been a substantial increase both in regard to gas and water.

The CHAIRMAN: If there are no other remarks, will someone second the adoption of the report?

Mr. EATON said no doubt Mr. Grimes would do so.

Mr. GRIMES, however, asked the meaning of the sum of £1043, balance carried to profit and loss account.

Mr. EATON said that was caused by the fact that wages were being incurred in order to carry on before they were quite ready for work. Wages and Directors' fees were being incurred when the gas and water services were being connected up to the mains; and now all was complete. Now these expenses were reduced to the ordinary working wages. The Directors would have been able to show a very much better account on that side if they had chosen to delay the balance-sheet another three months. Then it would have been very much more healthy.

Mr. GRIMES said he thought it was delayed quite long enough. He then moved the adoption of the report.

Mr. CLARKE (another shareholder) seconded, and it was carried, with one dissentient.

On the motion of Mr. EATON, seconded by the CHAIRMAN, Mr. Grimes was elected *nem. con.* a Director in room of Mr. Schofield.

Mr. EATON: There has been a certain amount of unwarrantable reports spread about this Company; but our business is done in a perfectly straightforward way. I may tell you quite frankly that, if one reads between the lines, in the City there is a strong reason for this criticism. This Company has not spent a great deal of money, and it is not anxious to do so. When we have applied for capital we have utilized that capital in the most economical way. There has been a lot of delusion in regard to this Company. It has been thrown at us that the only members of the Board are the members and their friends; and I hope this will show the shareholders that we welcome anyone from outside on the Board, and will welcome him as heartily as if he were a man we knew. I am extremely delighted, Mr. Grimes, to have you on the Board. I do not know you, but from what I have seen to-day I am sure you possess the business qualification we desire for membership of this Board.

The proceedings then terminated with the usual votes of thanks.

An Inquiring Shareholder.

The publication of the foregoing report evoked the following letter, dated the 4th inst., from Mr. W. Wynn Evans, of Clifford's Inn; and it appeared in our contemporary on Thursday:

> I was surprised to see the report of the annual meeting of the Company, in which I am an unfortunate shareholder, in the issue of to-day of your valuable paper. I find that several shareholders are in the same boat with myself, and never received a copy of the accounts or notice of the meeting. Why was this? Have the Directors any motive for it, or can it be that, by an oversight, the meeting was held on an inconvenient date, at an inconvenient place, at an impossible time, and—to make assurance doubly sure against other than certain shareholders attending—no notice should be sent to the others? The Directors seem to have a good deal to explain.

To the above letter were appended the following editorial remarks: "Doubtless Mr. Eaton and his co-Directors will lose no time in issuing their explanation. Mr. Grimes, of Chatham, whose inquiring spirit gained him promotion to the Board, has shown so intelligent a grasp of the position of affairs that, even if Mr. Eaton is silent, the shareholders may look with confidence to Mr. Grimes."

GLASGOW CORPORATION GAS SUPPLY.

Satisfactory Accounts for the Past Year.

The report of the Committee on Gas Supply, which was issued to members of the Corporation of Glasgow last week, was in the following terms:—

The gross revenue amounts to		£1,006,153
and the gross expenditure to	£784,682	
to which is added depreciation written off capital assets	59,835	
		845,517
The balance carried to profit and loss account being		£161,636
The Committee had to meet the following requirements during the year.		
(1) Annuities on stocks	£21,857	
(2) Contribution to Glasgow Corporation loans fund, in respect of Glasgow Corporation 3 per cent. stock redeemable in 1921, issued in lieu of converted gas annuities	8,288	
(3) Interest on borrowed money and redeemed loans	64,403	
(4) Sinking fund	47,775	
		142,324
Leaving a surplus on the year's operations of		£19,312
This surplus added to the balance at the credit of profit and loss account, carried from the previous year's account—viz.		16,176
leaves to be carried to the credit of next year's profit and loss account the sum of		£35,488

Your Committee have pleasure in stating that the price obtained for ammoniacal liquor and tar during the past year was higher than that obtained in the preceding year; the result being an increase in revenue from this source of £14,047. The average price received per ton of coal carbonized this year was 3s. 7·268d., compared with 3s. 2·934d. for the previous year—an increase of 4·334d. per ton. The increase referred to is to be solely attributed to the contracts for the purchase of these residuals having been let the preceding year at enhanced prices. The contract for the sale of the products at Tradeston Gas-Works, and the lease of the chemical works there, have been continued to Messrs. Robinson and Hunter from a period of five years from June 30 last, also at an increased price.

The sum realized from the sale of coke this year amounts to £118,799, an increase of £29,210 over that of the preceding year; this being due to the greater quantity sold and a higher price per ton obtained. The quantity of coke sold last year was 315,396 tons, as compared with 302,759 tons for the previous year, an increase of 12,637 tons. The average price received was 8s. 2·13d. per ton, compared with 6s. 7·23d. for the previous year, an increase of 1s. 6·90d. per ton.

Your Committee advertised for tenders for coal to be supplied during the coming year, and have concluded contracts for almost the whole quantity required at prices under those of last year. The quantity of coal carbonized during the past year amounted to 738,701 tons, as compared with 740,492 tons for the preceding year, a decrease of 1791 tons.

The rate of interest payable to the Corporation loans fund in respect of money borrowed was £3 5s. 9d. per cent., the same as in the preceding year, and £3 3s. 6d. per cent. for the year ending May 31, 1906. Your Committee applied £3457 of the amount at the credit of the sinking fund to the extinction of £1037 10s. of £9 per cent., and £405 of £6 15s. per cent. gas annuity stocks; and the annuities formerly payable upon these stocks now cease to be a charge upon the revenue of the department. There has also been redeemed during the year by the application of moneys at the credit of the same fund £4084 of Glasgow Corporation 3 per cent. stock, and a further amount of £46,625 of loans raised under the Acts of 1869, 1898, 1901, and 1905. The amount carried to sinking fund for redemption of loans and redemption or conversion of annuities was £47,775; and the accumulations and interest during the year amounted to £15,781—making the total addition to sinking fund for the year £63,556. The sinking fund, with its accumulations, now stands at £731,808, of which there has been already applied in the redemption of borrowed money 3 per cent. stock and annuities, £648,226, leaving still available for either of these purposes the sum of £83,582.

Having regard to the favourable result of the year's operations now recorded, and to the decreased prices at which the coal required during the next year has been purchased, your Committee feel that they are justified in recommending to the Corporation a reduction of 3d. per 1000 cubic feet; making the prices to be charged for gas for the current year, as from the date of the last survey, as follows: (1) Lighting and domestic purposes: Within the city and suburbs, 2s. 1d. per 1000 cubic feet; within the Milngavie area of supply, 3s. 1d. (2) Motive power purposes: Within the city and suburbs, 1s. 9d. per 1000 cubic feet; within the Milngavie area of supply, 2s. 9d. (3) Manufacturing purposes: For manufacturing purposes, other than for lighting and domestic purposes, within the city and suburbs, 1s. 9d. per 1000 cubic feet; within the Milngavie area of supply, 2s. 9d. Where the supply of gas is given for manufacturing purposes, such supply shall be measured through a separate meter; and the minimum amount payable therefor annually and in advance shall not be less than £3. (4) Supply through prepayment meters: 2s. 8d. per 1000 cubic feet.

The works and mains have been maintained in an efficient condition during the year out of revenue. The greatest quantity of gas sent out during the year in 24 hours was 34,569,000 cubic feet. The maximum daily make was 31,827,000 cubic feet. The quantity of gas made per ton of coal carbonized was 9522 cubic feet, compared with 9391 cubic feet per ton for the previous year; the loss by unaccounted-for gas

during the year was 7·97 per cent., as compared with 9·28 per cent. the preceding year. Upwards of 20 miles of new mains have been laid during the year.

The following is an analysis of the sale of gas for the past year, as compared with the sale for the previous year:—

	Rate per 1000 C. Ft.	Year 1906-7. Consumption.	Rate per 1000 C. Ft.	Year 1907-8. Consumption.
	s. d.	Cubic Feet.	s. d.	Cubic Feet.
I.—Within the city and suburbs generally:—				
(1) Lighting	2 1	4,975,227,700	2 1	23,098,500
	—	—	2 4	4,971,288,200
(2) Gas-engines	2 0	—	1 9	7,708,700
(3) Do.	1 9	359,248,400	2 0	318,783,500
(4) Manufacturing	—	—	2 0	205,170,300
purposes	1 9	164,670,300	1 9	1,800
(5) Contract gas.	2 1	544,322,240	2 1	557,292,700
II.—Within the Milngavie area:—				
(6) Lighting	3 1	16,378,900	3 1	43,000
	—	—	3 4	17,974,800
(7) Gas-engines	2 9	458,500	3 1	410,800
(8) Manufacturing purposes	2 9	1,339,000	3 1	1,198,900
(9) Contract gas.	3 1	1,531,620	3 4	1,564,125
III.—Prepayment supply	2 6	167,946,666	2 6	110,364,600
	—	—	2 11	152,461,828
		6,231,123,326		6,397,361,753
Used at works		77,450,300		75,272,200
		6,308,573,626		6,472,633,953
				Increase, 164,060,327 = 2·6 per cent.

In the above analysis of gas consumption, a gratifying feature is the increasing demand for prepayment gas supply; the increase being 94,879,762 cubic feet.

The number of gas-engines in use, and the total horse power for this year and the preceding year, are as follows:—

	Number.		Brake Horse Power.
May 31, 1907	1,727		17,157
May 31, 1908	1,685		18,087
Decrease	42 = 2·43 p. ct.	Increase	930 = 5·42 p. ct.

The number of ordinary meters in use on May 31 last was 227,503, compared with 229,062 for the preceding year, a decrease of 1559. The number of prepayment meters in use on May 31 last was 35,466, as compared with 27,176 for the preceding year, an increase of 8290. During the year 29 593 meters were repaired, and 20,788 were examined while in use, of which 17,099 were found in a satisfactory condition, and 3689 were found defective and removed.

The number of gas-stoves on hire as at May 31, 1908, was 43,566. There are also 5903 stoves and small grills let out free of charge. The number of gas heating and cooking appliances sold during the year was 2761.

The capital of the undertaking is stated at £4,200,000; but of this sum authority has been granted by the Secretary for Scotland to borrow £1,400,000 for electricity purposes. The amount borrowed for gas purposes has been £1,445,390. There has been redeemed out of sinking fund £494,072; and there remains to be borrowed for gas purposes, £885,000. Annuities capitalized amounted to £415,000. Since 1903 redemptions from the sinking fund have been effected to the amount of £56,925. Part of the annuities fund has been converted into 3 per cent. Corporation stock, redeemable in 1921; and the fund now stands at £260,117. The amount of capital expenditure is stated at £2,504,310. During the year there was expended, of capital, £41,577. Of this, £1494 was expended upon Dawsholm station and works, £1580 upon Tradeston station and works, £181 upon Provan chemical works, £13,963 upon pipes and cost of laying, £17,591 upon meters, and £10,510 upon gas-stoves (but sales of these realized £3744, which reduces the entry to £6766).

In the revenue account, the total revenue was £1,006,153, an increase of £140,682. From the sale of gas there was realized £738,476, an increase of £97,413. Coke yielded £118,799, an increase of £29,210, ammoniacal liquor and tar yielded £136,735, an increase of £14,048. Waste lime realized £826, an increase of £117. Rents of house properties and chemical works amounted to £3609, a decrease of £780. Stove-hires amounted to £7528, an increase of £575. There was derived from incandescent stair lighting (a new item) £82.

On the expenditure side, coal, including carriage (738,700 tons at 12s 4·6d. per ton), cost £457,476, an increase of £97,044; purifying materials, and oil, water, and sundries at works cost £33,966, an increase of £833; salaries of engineers, superintendents, and officers at the works amounted to £5018, a decrease of £3; workmen's wages amounted to £77,824, a decrease of £2029; and repairs and maintenance of works and plant, machines, apparatus, tools, materials, and labour, amounted to £66,020—an increase of £7361. The total cost of the manufacture of gas was £643,175, an increase of £103,250. Distribution of gas cost £70,298, an increase of £7489. In the stove account, the expenses chargeable to repairs are stated at £15,124, an increase of £4320. Rents, rates, and taxes amounted to £38,209, an increase of £5721. Management cost £15,063, an increase of £989. Law and parliamentary charges amounted to £1000, an increase of £346. Retiring allowances amounted to £1811, an increase of £13. Out of revenue, depreciation was written off to the amount of £59,835, an increase of £5167. The items of the depreciation were: On gas-works, at 1½ per cent., £22,019; on chemical works, at 3 per cent., £2890; on pipes, at 2 per cent., £9858; on meters, at 6 per cent., £14,682; on stoves, at 10 per cent., £6628; and on premium, at 2½ per cent., £4357. The balance carried to profit and loss account was £161,636. The profit and loss account, including a balance of £16,176 brought forward, amounted to £177,812. The payments out of it were: Annuities, £21,857; interest on 3 per cent. redeemable Corporation stock, £2788; interest on loans, at £3 5s. 9d. per cent., £51,491; interest on redeemed mortgages and redeemed loans, £12,912; and placed to sinking fund, £47,775—leaving a balance to be carried forward of £35,489.

Debate in the Council.

Bailie M. W. MONTGOMERY, the Convener of the Committee, at the weekly meeting of the Corporation last Thursday, said the results of the year's working were satisfactory in every way. The revenue had reached £1,006,153, which was the largest recorded for one year in the history of that or any other department of the Corporation. After meeting all their obligations, there remained a surplus on the year's operations of £19,312. The large revenue during the year was attributable, first, to the advance in the price of gas which they were compelled to make last year; and, secondly, to increased revenue from residual products. It was interesting to note that the revenue from coke last year amounted to £118,000, being an increase of £29,000 over the previous year; while the revenue from tar and liquor amounted to £136,000, or an increase of £14,000. Then, thirdly, there was an increase in the sale of gas of over 2 per cent. This was a most gratifying feature, and showed that, as an illuminant, gas still progressed in popularity, as giving the maximum of light at the minimum of cost. The quality of the gas was about 18-candle power; and it was admirably adapted for incandescent lighting. The amount derived from the hire of gas-stoves continued to increase, though not to the extent he could desire. The facilities offered by the Corporation in that way could not be too widely known. The stoves supplied were all of the latest pattern, and were let on hire at a nominal charge. He believed that many citizens who did not use these stoves for cooking or heating would find it greatly to their advantage to do so. One thing was certain—that the more general use of gas-fires instead of coal-fires would result in a partial abatement of the smoke nuisance from which they suffered, in common with all other large manufacturing centres. A special feature of interest in the report was the great increase in the demand for prepayment meters. It was only a few years since they introduced these; and already they had over 35,000 in use. They evidently supplied a want. They would remember that last year, when they altered the price of gas, they had to alter the mechanism of the meters also, at very great expense. He was glad to say, however, that they did not propose to alter the meters this year, because the reduction proposed amounted to about a penny in the shilling, and the consumers would just get this penny back, every time that the collector called. So that, they would see, there would not only be a great advantage to the consumers, but in everyone of these 35,000 odd houses there would be a savings bank. He would like to refer to an alteration which had been made in fixing their depreciation. It had been the practice in the department to fix the depreciation on the capital cost as diminished from year to year by depreciation. They had decided to alter this method. The depreciation would now take place every year on a fixed standard—the amount as standing in the books at May 31, 1906, *plus*, of course, any capital expenditure during the year. Before sitting down, he desired to acknowledge the efforts of their Engineer—Mr. Alex. Wilson—and his staff, in bringing about the gratifying results of the past year. While they blamed their officials when they thought they deserved it, they should be unstinted in their recognition of their efforts when they brought about such results as they had had, and which were largely due to careful, skilful, and efficient management. Look at these two points—the amount of gas sold per ton of coal carbonized, and the percentage unaccounted for. The gas produced per ton of coal carbonized last year was 9522 cubic feet, against 9391 cubic feet the previous year—an increase of 131 cubic feet. If they calculated this (they consumed about 800,000 tons of coal in a year), they would see the immense saving which had been accomplished by careful and skilful management. They had carbonized less coal, and yet had produced more gas. The leakage had been reduced from 872 to 760 cubic feet per ton of coal carbonized. Only a few years ago, the figure rose as high as 1057 cubic feet per ton. He considered they ought to recognize, and place on record their appreciation of, the efforts of the staff who brought about results so gratifying and so profitable as these. The position they were in reflected the greatest credit upon Mr. Wilson and upon his Station Managers. The Committee had great pleasure in recommending a reduction to the extent of 3d. per 1000 cubic feet in the price of gas. In these days, when they heard so much about trade depression, and circumstances not looking so bright in the commercial world, and when other rating authorities were raising their rates, he felt sure that the substantial reduction they proposed would be very welcome to the great body of the citizens. It meant a distribution among the gas consumers of £80,000. He moved the adoption of the report and accounts.

Mr. T. PAXTON, the Sub-Convener, seconded, and said he was one of those in the Committee who believed that the reduction should be greater than 3d.; but he was sorry to say he got very little support for his proposal. When he told them that the Committee had, on the purchase of coal, saved £73,000, and they had £35,000 of a surplus from last year, they would see that they had over £100,000 to come and go upon; and in these circumstances, notwithstanding it was stated that the revenue this year would be very much less, he thought they could have made a reduction of 4d. Six months ago, Mr. Wilson suggested that they should employ an expert to lecture to people in Glasgow. This was agreed to. A good many people in Glasgow believed that they had nothing to learn about the use of gas. Crowds of them, however, went to the Technical College to listen to the lecturer, who gave them much information as to how to employ gas for lighting, cooking, and heating. He was sure it was of the greatest possible benefit to the people to know how to use gas. The first thing that the gentleman told them was that he was surprised to find that the first gas-burner which was invented was still being used in the stairs in Glasgow—the rat-tail burner was yet in use. This proved that they

had still a great deal to learn. He agreed with the high tribute which had been paid to the heads of the department for the success which they had attained; but he would like to say, as a member of the Committee, that during the past year they had had no trouble with their workmen. The workmen had, in great measure, contributed to the marked success of the concern; and they, as well as the heads of the department, were entitled to some credit. When he went first to the Gas Department, there was a great deal of trouble. The reason for the change he could not tell—whether it was that Mr. Wilson had got a better grip of the men, or whether it was that the conditions of service were better.

Mr. ALSTON concurred that it was desirable that the citizens should know more about the use of gas for cooking. He believed that in some cities these useful little appointments were provided free of cost altogether. This would be of very great advantage in Glasgow; and it would make a great improvement in the consumption of gas. He hoped the Committee would look into the matter.

Mr. MURRAY pointed out that, while there had been a great increase in the consumption of gas, it had been found, in nearly every other department, that trade had not been so good within the city. He would like to know, if it were possible to give the information, if the increase in the amount of gas consumed had not been from outside the city, and not within the limits of the city boundary.

Bailie MONTGOMERY replied that it was very difficult to ascertain this; and it could not, in any event, be answered off-hand. Mr. Murray was a member of the Gas Committee, and he might get the information there.

Mr. T. SUTHERLAND, speaking of the increase in the number of prepayment meters, said that he, as a tradesman, knew there were a great many tenements in which there never had been a gas-meter, but into which gas was now being installed. This was being done, too, among the very poorest of the citizens. The poorer classes liked to pay their way; and he was sure they would prefer to pay by means of a prepayment meter than to wait for a collector coming round at the end of the quarter. He wished to compliment the whole of the officials of the Gas Department upon having collected the enormous revenue of over £1,000,000; and he was confident that this large sum had been secured with the minimum of expense.

The motion was then agreed to; and upon the formal motion of the CONVENER, the prices of gas were fixed as recommended.

GAS MANAGER'S SALARY AT HALIFAX.

A proposal of the Halifax Gas Committee to raise the salary of Mr. John Wilkinson, the Manager, from £600 to £700 a year, met with some opposition (eventually unsuccessful) at last week's meeting of the Town Council.

In moving an amendment referring the recommendation back to the Committee, Mr. Sowood, a Labour member, said his party desired the best management of municipal undertakings; and they believed that in Mr. Wilkinson the Corporation had a competent Manager, who was paid for work he was doing. Mr. Wilkinson had done much towards the success of the gas-works, just as every workman in connection with the department had done his share in proportion. Mr. Brooksbank, who seconded the amendment, urged that with the rates at 9s. in the pound, it took tradesmen all their time to make ends meet; and he thought it was not opportune to increase an official's salary to the extent of £100, when that official was already receiving £600 a year. Alderman Smith suggested that the Council would be inconsiderate to the ratepayers if they allowed a good official to leave their employ because they did not give him a just return for his abilities. In the past they had made serious mistakes in allowing good men to go—throwing away thousands of pounds in trying to save a few hundreds in salaries. Mr. Skinner, the Vice-Chairman of the Gas Committee, said it would be impossible to point to any gas-works where the conditions of labour and pay of the men were better than at Halifax. He knew for a fact that Mr. Wilkinson could go elsewhere at a considerably higher salary if he chose. Mr. J. Collinson, the Chairman of the Gas Committee, said he believed that Mr. Wilkinson was the lowest-paid gas manager in England for the size of the works. As Chairman of the Committee, he took no credit for the result of the policy adopted at the gas-works, in comparison with the credit he gave to Mr. Wilkinson; and he assured the Council they would make a mistake from the economic point of view if they refused the advance.

The amendment was defeated; 15 voting for it, and 36 against. The minutes were then carried.

Chester Gas Company.—Presiding at the half-yearly meeting of the Chester Gas Company last week, Mr. J. G. Frost, the Chairman, referred with regret to the loss of the old Chairman, Mr. John Gamon, who joined the Board in 1878, and succeeded to the chair in 1894. The extra cost of coal for the half year was £1117; but this was nearly met by an additional £600 received for residuals, and £400 more by the sale of gas. The report, which was adopted, stated that the balance to the credit of the profit and loss account, after providing for interest on the debenture stock and the dividend on the preference stock, was £4126. A half-yearly dividend of 2½ per cent. on the ordinary stock of the Company was declared.

Public Lighting of Beckenham.—The Beckenham Urban District Council have adopted a recommendation of the Finance Committee that application be made to the Local Government Board for sanction to a loan of £17,000, to enable electricity to be used instead of gas for street lighting. The South Suburban Gas Company wrote suggesting that—while, as ratepayers, they would have no reason to complain if the streets could be lighted by electricity giving an equal light for less cost than gas or a better light for the same cost—they should be allowed to fit up some inverted incandescent gas-burners, so as to give a demonstration of their advantages for street lighting. The proposal was accepted, on condition that the experiment is made at the Company's cost, and with certain provisions as to records and time limit.

GAS v. ELECTRICITY AT MALTON.

The proceedings at the half-yearly meeting of the Malton Gas Company last Wednesday showed that the question of gas *versus* electric light, which has for some time caused agitation in the town, is still being discussed with much earnestness. In the course of his remarks when moving the adoption of the report, the Chairman (Mr. Hugh W. Pearson) complained strongly of the partial conduct of the Urban District Council with regard to the support they had given to the Northern Counties Electricity Company, who, it may be remembered, some three years ago established works in the town, and afterwards secured the contract for the public lighting. The Directors stated: "The Company continues its steady course unaffected to any appreciable extent, if at all, either by the competition of the Electricity Company or by the loss during the past three years of the contract for the public lighting of the Malton section of the area of the Company's operations. The demand for gas by the general consumer for all purposes steadily increases; and the increase in the number of users of penny-in-the-slot meters is very remarkable and a source of satisfaction to the Company."

Having made a few remarks on the Company's position, the Chairman said he should like to refer to the controversy going on with the Council as to the lighting contracts. First, he would for a moment revert to the agreement made between the Council and the Electricity Company, when the consent of the Council to the Provisional Order enabling the Company to come to Malton was obtained. It provided that the public lighting should be done at a reduction of 30 per cent. on the price paid for gas lighting. As the Gas Company were then receiving about £440 for the public lighting, it would be seen that the Council should have called on the Electricity Company to do the lighting at not more than £310 a year. As a fact, they paid the Electricity Company £359; and this was for both a smaller number of hours and less light than under the Gas Company's contract. In 1905, the Gas Company's offer was to do the lighting at fully £20 a year less than the Electricity Company, and to furnish at least twice the illuminating power—in fact, to provide lamps of 100-candle power against the Electricity Company's lamps of 47-candle power. Under the new contract just entered into, the Council were to pay £400 instead of £350 a year (the Electricity Company wanted £420), and the ordinary lamps were to have a nominal illuminating power of 47 candles, whereas in the old contract they were specified to be of 70-candle power. They thus arrived at the astounding position that apparently the Council during the next three years were to use the ratepayers' money (and the Gas Company were the largest ratepayers in Malton) to give the Electricity Company £41 a year more for supplying 33 per cent. less light. But this was not the worst. The 33 per cent. less light was apparent rather than real, as during the last three years, though the Electricity Company contracted for 70-candle power lamps, they had supplied lamps which had not more than 47-candle power. This was now confessed; and in the new contract the same lamps that had done duty as 70-candle power lamps in the old contract remained in the new one for what they really were—viz., 47-candle power. The public had been treated on many occasions to some wonderful fairy tales about the saving and economy effected by the Council in the matter of public lighting. He had now given the actual facts and figures, which were all capable of proof, chiefly from the Council's own documents. The public could judge of the validity of the claim to efficiency and economy. But they had also a ready comparison which everyone could see and understand. Norton was still lighted by the Gas Company with 91 lamps, of a total of 6580-candle power; and the cost last season was £151 10s. To come from Norton into Malton, it was generally observed, was to "come out of light into darkness." In Malton they rejoiced in the benefits of electric lighting by 180 lamps, of a total of 9800 nominal candle power, at a cost of £400, and where a considerable percentage of the lamps were usually out. The cost to Malton, on the same basis of candle power as Norton was now paying, would be £225 instead of £400; or, on the basis of price per lamp, it would be £300 instead of £400. The Gas Company were content to rest on this comparison.

The report was adopted; a dividend of 6 per cent. for the half year was declared, with a carry-forward of £1885; and votes of thanks were passed to the Chairman and Directors—the former being complimented on his lucid statement.

GAS v. ELECTRICITY FOR ASYLUM LIGHTING.

With further reference to the above subject, which, as stated in the "JOURNAL" last week, is causing some controversy at Cambridge, in connection with the lighting of Fulbourn Lunatic Asylum, we find that the Committee of the Ratepayers' Association had the matter under consideration last Tuesday, and unanimously passed a resolution asking the Town Council to withhold their consent to any expenditure until they were quite satisfied that the best scheme had been put forward, in the interests alike of the ratepayers generally and of the Asylum. It was pointed out in the resolution that the Committee felt that the question was of so much importance, and that there was such a great difference of opinion regarding gas or electric light being the best for use at the Asylum, on account of the first outlay and also the annual cost, that it was desirable the Town Council should not at present give their consent to the proposals. The action of the Committee has been confirmed by the Association, and the Secretary instructed to forward to the Mayor a copy of the resolution.

The "Cambridge Daily News" last Wednesday contained a letter from Mr. Joseph Davis, the President of the Eastern Counties Gas Managers' Association, on the subject. He expressed the hope that, in the interest of all concerned, the Borough Council would hesitate before accepting the statement of Mr. Graham Harris, as set forth in his report on the lighting of the Asylum, that 12,000 units of electric current were more than equal to 3 million cubic feet of gas, as it was utterly opposed to fact and every-day experience. "You are well within the mark," he said, "when you estimate the candle-power value of 3 million cubic feet at 45 million candles, and somewhat over the mark

at placing 12,000 units of electric current at 12 million candle power, even with the new Osram lamp. It therefore stands to reason that, to get the same energy from electricity as that obtained from gas, nearly four times the quantity of the former will be required. Cost naturally follows." Mr. Davis then quoted the comparison made by Mr. J. H. Canning in his paper submitted last year to the Wales and Monmouthshire District Institution of Gas Engineers and Managers, to which reference is made by Mr. Thomas Frizelle, in his Inaugural Address to the Irish Association, which appears elsewhere. It is there shown, as Mr. Davis pointed out, that electricity costs £3 7s. 5½d., while gas only comes to £1 2s. 9d.—one-third less than the cost of the most efficient of the metallic filament lamps. After dealing with the subjects of cleanliness and ventilation, Mr. Davis concluded as follows: "I cannot help thinking that the question of lighting the Asylum by gas has not been treated so fully as it deserves; and of this I am certain—no electric light company in the world can successfully compete, light for light, and on the general question of cost, with a company supplying gas at 2s. 2d. per 1000 cubic feet."

At the meeting of the Cambridge Town Council last Thursday, a report by the Visitors to the Fulbourn Asylum, in which the Council were asked to sanction the expenditure of the borough's proportion of the cost of lighting the Asylum, in accordance with the offer of the Electric Lighting Company, was submitted. Alderman Dalton gave a short account of what had taken place in regard to the scheme for improving the lighting of the Asylum. He said the offer of the Gas Company was to supply a minimum of 3 million cubic feet of gas, which the Visitors would have to pay for whether they used it or not. This amount, according to Mr. Graham Harris, would be adequate for the needs of the Asylum. It was admitted—and Mr. Harris in a recent letter had mentioned the fact—that the quantity of gas proposed to be supplied would give more candle power than the 12,000 units that the Electric Supply Company would furnish. What Mr. Harris maintained was that 12,000 units would be ample for the lighting, and should leave a substantial margin for other purposes for which it might be required. On the whole, therefore, the electric lighting scheme was cheaper. The comparison between the figures was as follows: The minimum charge of the Gas Company was £426 17s. 6d. per annum, which was, with the amount charged for the renewal of mantles, brought up to £461 17s. The minimum charge for the electric light was £348, including the renewal, cleaning, and maintenance of the lamps and shades—in fact, covering all that was wanted. The Visitors were unanimous in the opinion that the offer of the Electric Supply Company was not only more beneficial to the Asylum, but was also the cheaper. It was likewise an improvement from a hygienic point of view; while less painting and repairs would be required as the result of the use of electric light. As the matter was urgent, he proposed that the report should be passed to the General Purposes Committee, with power to consent, so as to avoid the delay that might otherwise take place during the holidays. The motion having been seconded, Mr. Coulson thought it was proposed to give the Committee too much authority. Alderman Taylor pointed out that there were altogether six schemes; but as the Visitors were in favour of the one for electric lighting, they refused to discuss the other five. The Visitors asked the Council to sanction the adoption of electricity without giving adequate reasons. Mr. Morley suggested that a Special Committee should be appointed to deal with the matter; and, after some discussion, this was decided upon.

INSPECTION OF FACTORIES AND WORKSHOPS.

Extracts from Divisional Inspectors' Reports.

In the "JOURNAL" for the 28th ult. (p. 226), we noticed the report of the Chief Inspector of Factories—Dr. B. Arthur Whitelegge, C.B.—for the year ending Dec. 31 last. We now give some extracts from the appended reports of the Divisional Inspectors.

Taking the Southern Division first, Mr. Edwards (Southampton) says that a large suction-gas plant was installed in a brick-works, and at the end of the making season the plant and engine were being cleaned prior to covering for the winter. A man opened the lower manhole of the scraper, and drew out all the coke. It never occurred to him that the upper manhole should also have been opened, or that it was necessary to pump out any remaining gas; so that when he took a light to examine the scraper by means of the lower manhole the collected gas exploded, knocked him down, and scorched his face. Had he been directly in front instead of at the side, the explosion would probably have been very serious in its results. Mr. Edwards also quotes the following from Mr. Seymour: "In all places where suction or producer gas is in use, the men are warned as to its danger; and in water-gas works, oxygen bottles and safety masks are always suggested. At one in particular, two or more miles from a doctor, it has been recommended that the men should be trained to give first aid in gassing cases. Fatalities are few; but one usually obtains particulars of gassing accidents on inquiry." The dangers of gassing and the precautions adopted are illustrated by two other reports. Mr. T. C. Taylor (Norwich) says a case of gassing occurred at a suction-gas plant; a man being overcome while cleaning the scrubbers, which he had entered too soon after opening. The ventilation of the gas-house, however, was insufficient; and this, no doubt, had some effect in preventing the gas getting away. Additional ventilation has since been fitted, and instructions given as to cleaning. Mr. Stevenson Taylor (Plymouth) says all occupiers of factories in which producer gas, carburetted water gas, or other gas containing carbon monoxide, is made or used, have received copies of the memorandum prepared by the Department. No reportable cases of poisoning by this gas have come to his notice; but several men have been affected for a few hours, and then been able to resume work. Some firms who have large suction or producer gas plants have provided oxygen cylinders.

In the Midland Division, the various forms of disaster arising from explosions are shown by Mr. Graves (Birmingham). Referring to the accidents which have occurred with enamelling stoves, he says makers are now beginning to insert in the doors of stoves a small mica observation window, to enable the worker to see whether or not the gas inside is alight. The explosion of unignited gas in a gas-engine silencer resulted in the death of one man and injury to another. An ordinary steel silencer was placed in a bricked-up chamber in the engine-room, and had communication with the open-air by means of a 7-inch pipe. Unignited gas passed from the engine to the silencer, and when the engine started the hot gases therefrom exploded the gas, and, despite the free opening to the air, the silencer was blown to pieces. An explosion reported by Mr. Harding occurred in a pitch-cooler at a tar distillery, which, by a miracle, did not cause any personal injury, as the end of the plate of the cooler (about 8 feet in diameter) was blown 100 yards into the rear of a neighbouring factory. Mr. Ashworth and Mr. May both refer to gas explosions due to fixing gas-jets inside the ovens in bakehouses. The latter also complains of the use of gas in enclosed spaces or underground floors, instancing an explosion in an ice factory. Mr. Nicholl mentions the causes of back-draught at boilers, and the propriety of ventilating all gas-engine houses. In this he is supported by Mr. May's experience.

In the North-Eastern Division, Mr. Dunolly (Stockton) says many plants for the recovery of bye-products in the distillation of coal are in course of erection in connection with coking plants and gas-works, in addition to those already in full work. He points out that where these processes do not include the recovery of the sulphur, great care is necessary in disposing of the waste gases containing a large percentage of sulphuretted hydrogen. A fatal accident was due to poisoning while a man was employed in cleaning out and renewing the oxide used for the absorption of this. The oxide bed consisted of a shallow brick structure (4 feet deep) divided into two compartments, the floor being fitted with grids on which rested the oxide to a depth of about 3 feet. At the time of the accident, one of the compartments had been opened for the purpose of removing the spent oxide, while the other portion was in use. The deceased stepped into the open compartment, and was overcome by the gas which escaped through a fissure in the crust of the oxide in the compartment in use. An important point brought out at the inquiry was that these beds should be protected from the weather (as far as it is possible to do so without interfering with efficient ventilation), because excessive moisture causes the oxide to form a hard crust on the surface, which obstructs the free exit of the unabsorbed gases, and causes back-pressure and leakage at the water-seals.

In the same division Mr. Bennett (Sheffield) says the principal classes of works which form a rapidly growing new industry in this district are the coke-oven bye-products recovery plants, working on various systems, attached to collieries. At one new plant, a serious explosion of an ammonia liquor tank occurred in 1906. After consultations with an eminent chemical engineer early last year, seven formal additional special rules were proposed and put in force. In carrying out these rules, inexperienced men should have an oxygen gas-bag, into which the gas from the cylinder is run before connecting on a respirating tube with stopcock to the "gassed" person. A nozzle, to be placed between the teeth, is found to be better than a respirating cup. The best test for the pressure of gas is obtained by holding the nozzle pointing to the tongue until the issuing gas is first felt on the tongue.

One of the Inspectors for the division which includes Scotland and Ireland—Mr. Jackson, of Dublin—referring to the subject of the temperature of workrooms, says the difficulty chiefly met with in the district is not that of excessive heat, but of lack of suitable means of heating. Gas-jets as a means of heating are often used; and it is difficult on a dark morning or afternoon in the winter to say how far they have been required for lighting. Mr. Jackson has also had to condemn the use of unventilated gas-stoves in several places. In two cases the stoves were so placed that the fumes from them rose directly under where women were at work, and must have been breathed by them. One prosecution was undertaken, and a substantial fine was inflicted. Mr. Jackson also gives particulars of the fatal explosion at the Dublin Gas-Works early last year, resulting in injury to seventeen men, two of whom afterwards died. He reports that since the accident, ventilating grids have been fitted between each pair of purifying-boxes, and the incandescent electric lights in use at the time replaced by electric hand torches, and the fastenings of the hopper doors improved. Every gas-works on the registers has been visited, and the arrangements of the purifying-houses carefully inspected. It has been found necessary to call attention to defects in construction or to unsafe means of lighting in 25 cases, in most of which Mr. Jackson has received assurances that the matters complained of would be remedied. In one case, however, it would require the rebuilding of the entire works to make it safe; the purifying-house being within a few feet of the gasholder. In most cases old lamps have been discarded and electric torches supplied in place of them. Mr. Warren (Dublin) reports that in the gas-works he has revisited, the suggestions previously made have been carried out, and that he has not found any places where fixed lights of any description were located within the houses. In a few cases hand electric lamps are kept; but nearly all the managers are emphatic in saying that no light of any kind is ever needed.

Mr. Newlands (Edinburgh) says the increased attention given during the past year to means of heating in factories and workshops has led to an increased introduction of flueless gas-stoves. He considers that even the best types of these stoves are open to grave suspicion; while with the ordinary or cheaper kinds vitiation of the atmosphere is marked. Late in the spring he found, on visiting a large dressmaking factory, no provision for heating except two large paraffin lamps. He asked that some efficient means, not liable to vitiate the air, should be adopted before the cold weather set in. He visited again in November, and found flueless gas-stoves had been put in. One had been procured early in April as an experiment, and the others more recently. Though the walls of this factory had been limewashed some four months previously, he found that behind the stove the walls were blackened to the roof. The stove consisted of five ordinary fishtail gas-burners of large size used to heat a series of air channels; no means being taken to filter the fumes, far less to prevent their escape into the air of the factory. There was a shoulder at the back of this stove for a pipe; showing that the makers were alive to the necessity of carrying away the fumes. Mr. Newlands immediately required the adoption of some more efficient and less unhealthy means of heating, and received a few days afterwards a

guarantee, from the gas manager from whose offices the stoves had been purchased, that they gave rise to no vitiation. In view of the amount of work done in other districts in removing such stoves, he gives the alleged guarantee *verbatim :*

The circumstance that the Factory Act Inspector has taken exception to three . . . burning in your premises without flues has been brought to my notice this morning, and, in reply, I would like to point out that in the first instance there must be tens of thousands of gas-fires of this type in use in the country, and, as far as I know, this is the first occasion an exception has been taken to this method of heating. Perhaps I may go further and point out that there is no difference whatever between the . . . you have burning than if you were to light a few gas-jets in the shop. The fire consists of so many luminous flames burning gas through burners of exactly the same type as are used for flame illumination ; and there is no more need to have a flue to the gas-fire than there is to every gas-jet burning on a bracket. I am quite sure that you have only to point out this fact to the Inspector, when next he calls, to assure him that there is no reason to fear injury to the health of the occupants of the premises.

In the course of the report of the Principal Lady Inspector (Miss Anderson), Miss Power offers some observations on the heating and lighting of tailors' workshops. She says that the conditions were found very unfavourable during the winter months ; for towards evening, owing to use of illuminating gas-jets and to the gas-irons required for the work, the temperature becomes high, and the air consequently dry and foul. Miss Power adds : "With regard to the objection which must be made to illuminating gas and to oil for warming and lighting, on account of the deleterious substances which are liable to be evolved, in addition to carbon dioxide, and escape into the air as products of combustion, the possible development of alcohol lamps and stoves is of interest in this connection. One gramme of alcohol produces 7200 calories, and though the flame is non-luminous, its heating power makes it excellent for lighting purposes when an incandescent mantle is adopted. The lighting power compares favourably with kerosene ; the value being for alcohol 1732 candle-power-hours in comparison with 883 for kerosene. Thus in America alcohol at 40 c. per gallon can compete with kerosene at 18 c."

Miss Anderson's report is followed by that of the Electrical Inspector (Mr. G. Scott Ram), which was dealt with in "Electricity Supply Memoranda" last week, p. 301, and also by the report of the Medical Inspector (Dr. T. M. Legge), which is accompanied by several appendices.

PLYMOUTH AND DEVONPORT WATER SUPPLY.

Referring to the proceedings at the meeting of the Devonport Town Council on the 30th ult., as reported in the "JOURNAL" last week, a local correspondent writes : "The discussion respecting the water supply is curiously reminiscent of the debates which went on in the same community on the same subject 150 years ago. When what is now Devonport was chosen by William III. as the site of a Government Dockyard, and began to grow into a place of some importance, its near neighbour Plymouth was unquestionably jealous. It witnessed the flow of population and trade from its own ancient borders to the upstart, but rapidly extending, town with an anxiety which it made no attempt to conceal. Probably it had cause. As the new town, then called Plymouth Dock, grew, Plymouth itself decayed. But there was one advantage that Plymouth possessed which was denied to its rival. Thanks to the prescience of Sir Francis Drake and other Elizabethan municipal rulers, it had an abundant supply of water. There was sufficient to serve not only its own needs, but also those of half-a-dozen other towns of similar size. Plymouth Dock cast longing eyes upon the stream flowing to waste past its very doors ; but Plymouth was not to be cajoled into either giving or selling its surplus. What it had it would keep, even if the new town perished of drought. Dr. Johnson was strangely brought into the dispute. In the year 1762, when the controversy was at its height, he accompanied his friend Sir Joshua Reynolds on a visit to the great painter's native Devonshire. Being in Plymouth, says the faithful Boswell, Johnson considered it his duty to stand by the old town in opposition to the new one, and to imitate the passions of the place. 'No, no!' said he ; 'I am against the Dockers ; I am a Plymouth man. Rogues! Let them die of thirst. They shall not have a drop!' And not a drop could they get, so that they were forced to follow the example which Plymouth had set, and go to Dartmoor for an independent supply. Since then the 'Dockers' have gone their own way, and though a majority of the people in both towns are probably in favour of amalgamation, everything in the way of municipal services is being duplicated at a quite unnecessary cost. The present suggestion that Devonport should be saved the expense of constructing a reservoir by arranging with Plymouth for the use of its ample storage is quite feasible ; but the governing bodies cannot agree upon terms. Their case is not unlike that of the Potteries towns now progressing towards unification. Between Plymouth and Devonport there is such community of interest that no stranger could tell where the one town began and the other ended. In the matter of water supply, their interests are particularly interwoven. The leats and mains which serve the two towns run practically side by side for many miles. They are so connected that the Plymouth Corporation actually supply with water a large area now included within the borough of Devonport, while on many occasions—one as recently as last winter—Plymouth has helped Devonport to tide over temporary difficulties caused by drought or frost. History is, however, repeating itself. The jealousy which denied the 'rogues' a drop of water in the eighteenth century is sufficiently pronounced in the twentieth to keep the two towns at arm's length, and cause both to waste a lot of money on works which would not be necessary if a more reasonable spirit prevailed."

The Halifax Gas Committee have decided to keep in abeyance for a few months the question of putting down an installation of the Davis-Neill yellow prussiate plant. This, it is pointed out, will enable them to ascertain, before coming to a final determination on the matter, the results of further tests which the Gas Manager (Mr. John Wilkinson) is about to make.

NOTES FROM SCOTLAND.

From Our Own Correspondent. *Saturday.*

The most stupendous task of the year lies before me—that of adequately dealing with the gas accounts of the Corporation of Glasgow. They are so vast in their bulk, and touch so many points, that it is natural to shrink from venturing an opinion upon them after what must necessarily be a hurried perusal, as compared with the leisurely preparation of them by the responsible officials. On the financial side, they are almost beyond the lay mind to grasp. Any remarks, therefore, which I may be able to make will be only a skimming of the surface. The finances are in the hands of Mr. James Fleming, as Treasurer, who has presided over that department now for many years, and whose most excellent work, it seems to me somewhat singular, is passed year by year without a word of commendation or recognition by the councillors. The Council seem to expect a high standard of work from Mr. Fleming. They assuredly get it ; and when they get it, they accept it seemingly as a matter of course. Even upon the score of magnitude, were there no other quality in it, to assert which would be altogether contrary to fact, the Treasurer's is a great work, as will be realized when it is recalled that the revenue collected by his department last year amounted to over a million pounds. Having paid this well-deserved compliment to the good qualities of the treasurership, it is, perhaps, fitting to remark that in this great undertaking the Treasurer's Department is overshadowed by that of the Engineer. "Dividends are made in the retort-house" is a trite saying, and may be paraphrased as meaning that without efficient management in the works the best of financing would do little in the way of bringing prosperity. There was no stint in the Council last Thursday, in the matter of commendation of the successful efforts put forth by the Engineer—Mr. Alexander Wilson—and his staff ; and all that was said was thoroughly justified. Here I may remark that it was exceedingly gratifying to hear the staff associated with Mr. Wilson in the commendatory remarks ; for it brings into prominence what is a great truth, known to all who come into contact with the gentlemen in office, how magnificently they and he work together. It may be taken for granted that without loyal co-operation it would have been impossible to have attained the high yields from coal and the decrease in the unaccounted-for gas which were referred to by the Convener. Closely related to this there is a point in the revenue account which has impressed me—that is, the remarkable coincidence of the figures regarding the quantity of coal carbonized and the revenue from gas sold. The coal carbonized amounted to 738,700 tons, and the gas sold realized £738,475—almost £1 per ton. The average price of the coal was 12s. 4d. per ton, compared with 9s. 8d. the previous year. A feature in the output of gas which may be taken note of is the great increase in the consumption through prepayment meters. While the increase through ordinary meters was 40¼ million cubic feet, that through prepayment meters was 95 millions. There was also an increase of over 19 million cubic feet in the gas consumed for manufacturing purposes. The only decrease recorded is the consumption of gas in gas-engines, which went down during the year ; the decrease being, however, less than 3 million cubic feet. This doubtless points to the adoption of suction gas by manufacturers ; and the conclusion it seems to point to is that a still greater reduction in price will require to be made if the consumption of gas for power purposes is to be promoted. It may be of interest to know the make of gas in the different works during the year. In the Provan works, the output was 2,298,444,000 cubic feet--an increase of 135,403,000 cubic feet ; in the Dawsholm works, 2,739,275,000 cubic feet—a decrease of 33,827,000 cubic feet ; and in the Tradeston works, 1,996,174,000 cubic feet—a decrease of 21,651,000 cubic feet. The increased output, over all, was about 80 million cubic feet—equal to 7·9 per cent. In the previous year, the increase in the output was nearly 250 million cubic feet—equal to 9·2 per cent., and in the year preceding that the increase was over 255 million cubic feet—equal to 9·7 per cent. The rise in the price of gas, agreed to a year ago, has seemingly put a check upon the consumption ; or is it to the state of trade in the city that the lessened increase last year, as compared with the two previous years, is to be attributed ? I confidently anticipate that the results of the current year, when they come to be announced, will be found to be an advance upon those which have just been disclosed, excellent and admirable though they undoubtedly are.

In gas matters, the Corporation of Peterhead are still on the upward track. At a meeting of the Town Council this week, Bailie Birnie, the Convener of the Gas Committee, said it was with pleasure that he submitted the results of another successful year's working. Owing to the advance in the price of coal, the year now closed was commenced with some slight misgiving as to what might be the result. In many places more favourably situated than they were, the average rise in coal was 3s. per ton. Their average rise was only 1s. 7d. ; but even at this figure their coal had cost them £360 more than in the previous year. They had carbonized 4287 tons of coal, and produced 46,500,000 cubic feet of gas, or 10,846 cubic feet per ton. In the previous year, they thought they had done well in getting 10,679 cubic feet of gas per ton of coal ; but they had improved upon this by 167 cubic feet. Their increased output over the previous year was 3,621,100 cubic feet. They had spent £3849 upon coal, including freight, dues, and trimming, or £714 more than in the previous year. The total income from gas sold was £6848, against £6101—an increase of £747. They would observe that, excepting £32, it took all the increase in the gas sales to square the extra amount paid for coal. During the year, ordinary meter consumers increased by 51, and prepayment meter consumers by 102. The sales of residuals were £98 better than in the previous year ; and there was a saving of £154 upon maintenance of works and plant and incidental expenditure. In September last their new gasholders came into use, and had been working very satisfactorily. Leakage had been reduced by 2 per cent. ; and he looked for a further reduction from the new mains now nearing completion. The purification account had increased by £77, but this, he had been informed by the Manager, was an abnormal expenditure which would carry them through the current year. Stokers' wages were higher by £43 ; and he hoped that increased business would soon justify another rise in this direction. In accordance with the resolution

come to at the last audit, all meter repairs and renewals had been paid for out of revenue, and had cost £61. Rates and taxes claimed £654, or £169 more than in the previous year. With their increased capital expenditure, interest and sinking fund charges were £134 more than in the preceding year. Notwithstanding increased expenditure on these heads, which amounted to £724, they closed the year with a favourable balance of £727. Of the balance from the previous year they had still £500 to their credit. He suggested that they should add £200 to this, making £700 in all, and pay the cost of their new mains. The gas-cooker account amounted to £432, *plus* £151 of interest paid—a total of £583. There was recovered in hire £298; but this sum had gone to ordinary revenue, and no reduction had been made upon the original cost of these cookers, which, in an average of six years, would become the property of the hirers. He therefore proposed that they should place £100 to the reduction of their cooker account, and carry the balance of £427 to the reserve fund. Because of the much more favourable coal contracts, and the increased efficiency of the works from the recent improvements, he considered that they could quite justifiably reduce the price of gas to 3s. per 1000 cubic feet. He moved the adoption of these suggestions. He could not resume his seat without conveying to the Manager and to their employees the appreciation of the Committee of their loyal and efficient services. Mr. J. Wilson, in seconding, suggested that, considering the excellent work he was doing, their Manager—Mr. W. Ritchie—was underpaid. Bailie Bernie assented, and said that in 1902 they made about 29 million cubic feet of gas, and last year they made 46½ millions. In 1902, the turnover at the gas-works was £5000; and last year it was £9000. The Convener's motion was adopted; and it was remitted to the Gas Committee to consider the salary of the Manager.

The Gas Committee of the Dundee Town Council have this week let contracts for the construction of new purifier plant to the amount of £11,522. The construction of the purifier-house has been let to Messrs. A. & J. Main, Limited, of Glasgow; and the provision of the other plant to the Barrowfield Iron-Works, Limited, of Glasgow, and the New Conveyor Company, Limited, of Smethwick.

On the evening of Thursday of this week, the greater part of the town of Leith was left in darkness so far as the electric light was concerned. At the electric light station, the officials could not give any information as to what was wrong. Next morning, however, it was intimated that a cable in Lindsay Road had been found to be defective. This was repaired in the course of the day.

It has been decided to light the streets of Rugeley during next winter by incandescent in place of flat-flame burners; and an agreement to this effect has recently been come to with the Gas Company.

A dividend of 3 per cent. has been declared by the Leatherhead Gas and Lighting Company—making, with the interim dividend, 5 per cent. for the year. The Company's business has been of so developing a nature, that it has been resolved to issue the remaining portion of the debenture stock.

CURRENT SALES OF GAS PRODUCTS.

Sulphate of Ammonia. LIVERPOOL, *Aug.* 8.

The improved demand referred to a week ago has been sustained, and it has resulted in a further improvement in values; supplies not being too abundant, and the sulphate plant at many of the gas-works being stopped for annual overhaul. The closing quotations are, consequently, £11 5s. per ton f.o.b. Hull, £11 6s. 3d. per ton f.o.b. Liverpool, and £11 8s. 9d. to £11 10s. per ton f.o.b. Leith. There has again been large inquiry in the forward position; but, the large makers adhering for the most part to £12 per ton for delivery over the spring months, business has been rendered impossible—this price being much above the ideas of buyers. There has also been considerable inquiry for November-February delivery; but divergence of views has practically precluded business.

Nitrate of Soda.

There has not been much interest in this article, excessive visible supply frightening buyers. The spot market is very quiet at 10s. per cwt. for 95 per cent., and 10s. 3d. for refined.

Tar Products. LONDON, *Aug.* 10.

Business for the week has been exceedingly quiet, and the weakness of the market is generally commented on, except for creosote, which maintains its price; there still being inquiries for prompt and forward delivery. Pitch has not improved, and buyers are looking for lower prices. In London, it has been sold to the end of the year at 18s., and on the Continent, lower figures than this have been accepted. In fact, the equivalent of 17s. 6d. London has been taken for business to the end of the year. Sales have been made on the east coast for January-June at 17s. f.o.b. Though there are one or two sellers in crude carbolic, it is hard to find buyers even at present low figures.

The average values during the week were: Tar, 11s. 6d. to 15s. 6d., *ex* works. Pitch, London, 18s.; east coast, 17s. to 17s. 6d.; west coast, 16s. to 17s., f.a.s. Benzol, 90 per cent., casks included, London, 7d. to 7¼d.; North, 6¾d. to 6¾d.; 50-90 per cent., casks included, London, 7¼d.; North, 6¼d. to 6¾d. Toluol, casks included, London, 7¾d.; North, 7¼d. Crude naphtha, in bulk, London, 3¼d. to 3½d.; North, 3d. to 3¼d.; solvent naphtha, casks included, London, 10d.; North, 9d.; heavy naphtha, casks included, London, 9¾d. to 10½d.; North, 8¾d. to 9¼d. Creosote, in bulk, London, 2⅝d. to 2 11/16d.; North, 2¼d. to 2⅜d. Heavy oils, in bulk, 2⅝d. to 3d. Carbolic acid, 60 per cent., casks included, east coast, 1s. 4¼d. to 1s. 4½d.; west coast, 1s. 3⅜d. to 1s. 4d. Naphthalene, £4 10s. to £8 10s.; salts, 35s. to 40s., packages included and f.o.b. Anthracene, "A" quality, 1½d. to 1¾d. per unit, packages included and delivered.

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Sulphate of Ammonia.

The improvement reported last week has been maintained, and prices may be considered even slightly better. To-day's prices are: For the ordinary makes on Beckton terms £11 2s. 6d. to £11 5s.; Hull, £11 2s. 6d. to £11 3s. 9d.; Liverpool, £11 3s. 9d. to £11 5s.; and Leith, £11 7s. 6d. to £11 10s.

[In last week's London market report of sulphate of ammonia, the price at Hull was given as £11 to £11 13s. This should have been £11 to £11 1s. 3d.]

COAL TRADE REPORTS.

Northern Coal Trade.

There is a strong demand for coal; and though the output is heavy, it seems to be well taken up. In the steam coal trade, there is a keen inquiry for early delivery; and the prices are firm. Best Northumbrian steams are about 15s. per ton f.o.b., and they are strongly held at that price. Second-class steams are from 12s. to 12s. 6d.; and steam smalls from 6s. to 7s. In the gas coal trade there is now a growing home consumption; and with the exports still heavy, the production is only adequate. Durham gas coals vary in price from about 10s. 3d. to 11s. 3d. per ton f.o.b., for the usual qualities, and for "Wear specials" up to 12s. is quoted. A sale of about 30,000 tons of good Durham gas coals, for delivery extending over the next eight months or so, is reported; and the price is given at about 10s. per ton f.o.b. Other and larger lots are believed to be in treaty at near this figure, but exact particulars are not yet known. For further forward delivery, buyers seek concession in prices; but the prices seem steadier than they were. Coke is firm for export; and good gas coke is now quoted from 16s. to 16s. 6d. per ton f.o.b.

Scotch Coal Trade.

Trade prospects are brighter. The demand has strengthened, with the consequence that prices for ell and splint are firmer. There are already anticipations of a busy autumn season. The prices quoted are: Ell, 10s. 9d. to 12s. 6d. per ton f.o.b. Glasgow; splint, 11s. to 11s. 3d.; steam, 10s. to 10s. 3d. The shipments for the week amounted to 165,250 tons—a decrease (on account of holiday times) of 76,788 tons upon the preceding week, and of 68,937 tons upon the corresponding week of last year. For the year to date, the total shipments have been 7,981,355 tons—a decrease of 412,416 tons upon the corresponding period of 1907.

The Oldham Gas Committee have resolved that the lamplighters employed in the borough shall be granted a week's holiday each year, with pay. This concession, it is pointed out, is made in view of the fact that the lamplighters have Sunday duty, as well as week-day work, all the year round.

New Joint-Stock Companies.—A company under the title of Foreign and Colonial Lighting, Limited, has lately been registered with a capital of £30,000, in £1 shares, to carry on the business of engineers, producers of electric light or power, gas makers and suppliers, &c. The Irvine Gas Company was registered in Edinburgh last week, to acquire the undertaking of the Irvine Gaslight Company. The capital is £25,000, in shares of £1 each.

Gas Suffocation Case at Blackpool.—Last Sunday week, at Blackpool, a visitor from Heywood, named Shepherd, was found unconscious in his bed, with the room full of gas (though the window was at the time slightly open); and in spite of the efforts of three doctors, he died the following afternoon. A police sergeant subsequently made an examination of the room, in which it is said there was no fire-grate or chimney; the only ventilation being by a hole in the wall near the ceiling. It was found that the tap of the gas-bracket was defective. The Coroner's Jury returned a verdict of "Accidental death."

Gas Matters at Wolstanton.—Addressing the Wolstanton Urban District Council, Mr. J. H. Woolliscroft said it was a source of regret to the Gas Committee that, while at Silverdale and Wolstanton gas was being taken up well for cookers and by new consumers, at Chesterton it was not. They were all agreed in thinking that when in March the price of gas was reduced from 3s. 9d. to 2s. 10d. per 1000 cubic feet in Chesterton, it would be taken up well; but it had not been. In Wolstanton, from March to July, 52 new consumers had been put on; at Silverdale, there were 27 additional consumers; and in Chesterton, only 14. During the same period, at Wolstanton 100 cookers had been taken; at Silverdale, 24; and in Chesterton, 10. The output of gas was quite up to what was estimated for the first quarter. The total number of consumers was 3486, and of cookers 849. Application is to be made to the Local Government Board for sanction to borrow £4000, for the purpose of extending the mains and services, and providing new meters, stoves, and fittings.

A Deputation from Belfast.—A resolution of the Belfast Gas Committee, "that a deputation be appointed to visit other cities for the purpose of obtaining information with reference to the use of gas lime in the manufacture of bricks, the relative reliability of wet and dry meters, the class of houses in which automatic meters have been adopted, and the conditions under which boiling-rings and gas accessories are supplied," met with some opposition in the City Council; but it was eventually confirmed by a large majority. The assumption that the deputation would be "simply an excursion" was strenuously denied by Mr. J. A. Doran, the Chairman of the Committee, who said it was waste of time to attack the appointment of the deputation, if the interests of the ratepayers were to be considered at all. There were something like 40,000 or 50,000 tons of the gas lime; and if they could put down plant for manufacturing bricks, they could make a profit out of it. The deputation would inquire into several other things of importance; and he believed the Corporation would be well advised to approve of it.

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Cutting Off the Supply of Water to a Hydrant.

At the recent West Riding Assizes, before Mr. Justice Grantham and a Jury, a case was tried in which Mr. John Delaney, a quarry-owner, of Settle, sought to recover from the Earby Water Company damages for the wrongful cutting off of the water supply from the Grove Shed, Earby, on July 1, 1907, with the result that it was impossible to extinguish a fire which occurred there on July 19. Mr. Waugh, K.C., for the plaintiff, stated that the Water Company was formed in June, 1891, and acquired from the Trustee in Bankruptcy of the previous owner his rights in the undertaking. In 1894, plaintiff, who owned a mill at Earby, entered into negotiations with the Company to place a hydrant in the mill-yard to be used in case of fire and for filling the boiler. He let part of the mill to the Grove Manufacturing Company; and in June, 1907, he received a letter from defendants stating that it had come to their knowledge that plaintiff had been using water from the hydrant for purposes other than those for which it was intended. Though plaintiff intimated in reply that he was prepared to pay reasonable charges for the water, the supply to the hydrant was cut off. In July of the same year, a fire broke out at the mill; and, owing to lack of water, the premises were burnt out. Plaintiff received £375 from the insurance on his machinery; but after paying certain expenses he had £354. He estimated his loss at £50. A counter-claim was put in for £6 3s. 9d. for water used. On behalf of the defendants, Mr. Scott Fox, K.C., submitted that there was no contract in the case; only a licence for the water to be used in case of fire. It was used in an irregular way; and the Company had no check on the water consumed. Mr. W. N. Berry, the Chairman of the Water Company, said that in consequence of their limited storage, the Company had to be as economical as possible with regard to the water. On March 27 last year, at an informal meeting of the Directors, they decided to write to Mr. Delaney intimating that they had learned he had been using water from the hydrant (which was not supplied through the meter) for purposes other than those for which it had been originally fixed; and that unless a satisfactory arrangement was arrived at in the course of a few days, the hydrant would be disconnected from the Company's mains. Receiving no answer, the disconnection was made. Other evidence having been given, his Lordship, in summing up, said it was difficult to imagine a more unreasonable action on the part of a public or semi-public body than that of the Earby Water Company in disconnecting the plaintiff's premises at such short notice as they did. The Jury found for the plaintiff on the claim for damages, and for the defendants on the counter-claim; fixing the value of the water used by the plaintiff at £4. The amount of the plaintiff's damages was, with the consent of the parties, left for the Judge to decide.

Public Lighting at Acton.—At the last meeting of the Acton District Council, a letter was read from the Brentford Gas Company, offering further reduced terms for lighting the whole of the public thoroughfares by gas if the Council would enter into a contract for five years. In the event of any further reduction being made in the price of gas to private consumers, the charge to the Council for street lighting will be reduced *pro rata*. It was stated that the saving effected by adopting the Company's new offer would be £385 per annum. There was considerable discussion, in the course of which the Vice-Chairman remarked that anything they could do to show the Electricity Supply Company that they could get on without them should be done. It was decided to use gas lighting, except in certain of the main thoroughfares.

Maintenance of Gas-Lamps in Islington.—The Borough Engineer of Islington (Mr. J. P. Barber) has called the attention of the Lighting Committee of the Borough Council to the contract, dated May 1, 1903, with the Gaslight and Coke Company, by which the Company clean, light, extinguish, and maintain the public incandescent gas-lamps in the borough at a cost of 28s. a year; this sum including the renewal of mantles and the maintenance of gas-fittings, but not the work rendered necessary through vehicles colliding with the columns. The total cost works out at about £5824 per annum. At the last meeting of the Council, the Lighting Committee reported that they were advised that the work could be carried out for a considerably less sum, and they consequently recommended that six months' notice, expiring at Lady Day next, should be given to the Company to determine the contract. The recommendation was adopted.

Eastbourne Gas Company.—The report of the Directors of this Company for the half year ended June 30 states that the revenue account shows a profit of £8119. There is a balance of £17,274 at the credit of the profit and loss account, after payment of the half-yearly dividend in December last, and other charges. The Directors recommend a dividend for the past half year at the rate of 15 per cent. per annum upon the original capital, and also upon that raised on the "C" shares; and at the rate of 12 per cent. per annum upon the "B" shares. These payments will absorb £8077, and leave a balance of £9197 to be carried forward. The Directors have purchased a valuable freehold property at the rear of the present central depôt in Sussex Gardens, with a view to future requirements. A workshop is also about to be erected upon the land purchased last year; the repair of the large number of cooking and heating appliances out on hire rendering this necessary.

The Helensburgh Town Council are replacing an existing single-lift column-guided gasholder with a telescopic spiral-guided holder, and have given the order to Messrs. Robert Dempster and Sons, Limited, of Elland.

Sinking operations have just been started at Coombs Wood, in North Worcestershire, to reach a new seam of coal 10 yards thick and 400 acres in extent. It is expected that enough coal will be obtained to supply the manufacturing needs of the district for fifty years.

A pathetic honeymoon tragedy occurred on Monday last week at Cork, when James William Smethurst, a foreman at the Limerick Gas-Works, died suddenly on his wedding day. He left Limerick with his wife for Cork immediately after the ceremony, but died the same night. At the Coroner's inquiry next day, a doctor gave evidence that the unfortunate man suffered from heart disease, and that the excitement attending the wedding had caused his death. A verdict to this effect was returned.

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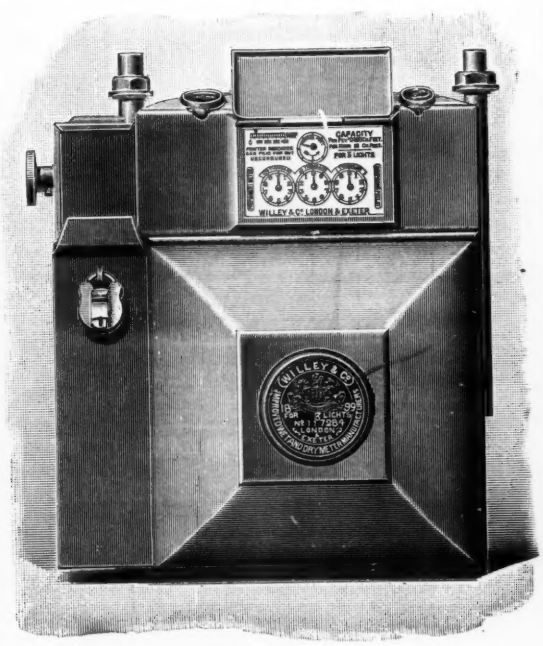

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No. 7.—"The Osram Lamp: Fiction and Fact."

This series of Leaflets will be useful, not only for distribution among Householders generally, but for circulation among Shareholders to fortify them with arguments in defence of the commodity in which they have invested capital. Copies of each Leaflet should also be kept in every Gas Undertaking's Show-Rooms.

Prices for Quantities on Application to WALTER KING, 11, BOLT COURT, FLEET STREET, E.C.

WANTED, FOR SALE, CONTRACT, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Situations Vacant.

AGENTS FOR PURCHASING AMMONIA AND TAR. No. 4971.
WATER ENGINEER. Hull Corporation. Applications by Aug. 28.

Pupil (Desirous of entering Gas-Works or Gas Engineering Firm) No. 4975.

Plant (Second-Hand), for Sale.

RETORT BENCH MOUNTINGS, PIPES, &c. Lochgelly Gas Company.

Plant, &c. (Second-Hand), Wanted.

WATER-GAS PLANT. "L 63," care of Lee and Nightingale's Advertising Offices, Liverpool.

Patents to Sell or Licences to Manufacture.

ACETYLENE LAMPS AND GENERATORS, &c. Haseltine, Lake, and Co., Southampton Buildings, W.C.
GAS BURNERS, &c. Cruikshank and Fairweather, Chancery Lane, W.C.
INCANDESCENT GAS BURNERS, Herbert Haddan and Co., Strand, W.C.
LIGHTING AND HEATING BURNERS. Haseltine, Lake, and Co., Southampton Buildings, Chancery Lane, W.C.
PIPE COUPLINGS. Lloyd Wise and Co., Lincoln's Inn Fields, W.C.

Meetings.

BARNET DISTRICT GAS AND WATER COMPANY. Holborn Restaurant. Aug. 31. 12.30 o'clock.
BRIGHTON AND HOVE GAS COMPANY. London Office. Aug. 28. 2 o'clock.
BROMLEY AND CRAYS GAS COMPANY. Bell Hotel, Bromley. Aug. 18. 6 o'clock.
CHICHESTER GAS COMPANY. Offices. Aug. 24. 1 o'clock.
HORNSEY GAS COMPANY. London Office. Aug. 21. 3.30 o'clock.
MITCHAM AND WIMBLEDON GAS COMPANY. Offices. Aug. 25. 3 o'clock.
NORTH MIDDLESEX GAS COMPANY. London Office. Aug. 26. 2.30 o'clock.
RIDDINGS DISTRICT GAS COMPANY. London Office. Aug. 31. 3.30 o'clock.

TENDERS FOR

Coal and Cannel.

BRADFORD GAS DEPARTMENT. Tenders by Aug. 27.
CARNARVON GAS DEPARTMENT. Tenders by Aug. 20.
CLEATOR MOOR URBAN DISTRICT COUNCIL. Tenders by Aug. 21.
DARWEN GAS DEPARTMENT. Tenders by Aug. 29.
HAVERFORDWEST CORPORATION. Tenders by Aug. 18.
LYMM URBAN DISTRICT COUNCIL. Tenders by Aug. 19.
STRATFORD-ON-AVON GAS DEPARTMENT. Tenders by Aug. 22.

Coke.

LEIGH-ON-SEA GAS DEPARTMENT. Tenders by Aug. 12.

Pipes, &c.

ISLE OF THANET GAS COMPANY. Tenders by Aug. 13.

Roof (Steel).

BURNLEY GAS DEPARTMENT. Tenders by Aug. 26.

Tank (Cast-Iron) Enlargement.

HINCKLEY URBAN DISTRICT COUNCIL. Tenders by Aug. 26.

Tar and Liquor.

LYMM URBAN DISTRICT COUNCIL. Tenders by Aug. 19.

Well Sinking, &c.

HINCKLEY URBAN DISTRICT COUNCIL. Tenders by Aug. 26.

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 378.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
590,000	10	Apl. 10	10	Alliance & Dublin 10 p.c.	19–20	..	5 0 0
268,324	10	,,	7	Do. 7 p.c.	13–14	..	5 0 0
310,000	Stk.	July 15	4	Do. 4 p.c. Deb.	99–102	..	3 18 5
200,000	5	May 29	6½	Bombay, Ltd.	6–6¼	..	5 0 0
40,000	5	,,	6½	Do. New, £4 paid	4¼–4⅜	..	5 9 6
50,000	10	Feb. 27	14	Bourne-mouth Gas and Water Pref. 10 p.c.	28½–29½	..	4 14 11
51,810	10	,,	7	Do. B 7 p.c.	16½–16¾	..	4 3 7
53,200	10	,,	6	Do. Pref. 6 p.c.	14½–15½	..	3 17 5
380,000	Stk.	,,	12½	Brentford Consolidated	243–248	+1	5 0 10
300,000	,,	,,	9½	Do. New	182–187	+2	5 1 7
50,000	,,	,,	5	Do. 5 p.c. Pref.	120–125	..	4 0 0
206,250	,,	June 12	4	Do. 4 p.c. Deb.	100–105	..	3 16 2
220,000	Stk.	Mch. 12	11½	Brighton & Hove Orig.	210–215	+2	5 4 8
246,320	,,	,,	8½	Do. A. Ord. Stk.	154–159	+2	5 3 9
460,000	20	Mch. 27	10	British	41–43	..	4 13 0
104,000	Stk.	Feb. 13	6	Bromley, Ord. 5 p.c.	116–119	..	5 0 10
165,700	,,	,,	4½	Do. do. 3½ p.c.	86–89	..	5 1 2
500,000	10	May 14	7	Buenos Ayres (New) Ltd.	11–11½	..	6 1 9
250,000	Stk.	June 26	4	Do. 4 p.c. Deb.	91–93	..	4 6 0
150,000	20	July 15	7½	Cagliari, Ltd.	24–25	..	5 16 0
100,000	10	—	—	Cape Town & Dis., Ltd.	4–6	..	—
100,000	10	Apl. 26	4½	Do. 4½ p.c Pref.	5–7	..	6 8 7
50,000	50	May 2	6	Do. 6 p.c. 1st Mort.	47–49	..	6 2 5
103,000	Stk.	June 26	4½	Do. 4½ p.c. Deb. Stk.	78–83	..	5 8 5
157,150	Stk.	Feb. 27	5	Chester 5 p.c. Ord.	111–113	..	4 8 6
1,493,280	Stk.	Mch. 12	5⅝	Commercial 4 p.c Stk.	106–111	..	4 13 8
560,000	,,	,,	5	Do. 3½ p.c. do.	101–106	..	4 14 4
475,000	,,	June 26	3	Do. 3 p.c. Deb. Stk.	81–83	..	3 12 3
800,000	Stk.	June 12	6½	Continental Union, Ltd.	110–115	..	5 13 1
200,000	,,	,,	7	Do. 7 p.c. Pref.	136–141	..	4 19 3
460,170	Stk.	—	5½	Derby Con. Stk.	121–123	..	4 9 5
55,000	,,	—	4	Do. Deb. Stk.	103–105	..	3 16 2
148,995	,,	Mch. 31	5	East Hull 5 p.c. Ord.	100–103	..	4 17 1
486,090	10	July 15	12	European, Ltd.	22½–23½	..	5 2 2
354,060	10	,,	12	Do. £7 10s. paid	16½–17½	..	5 2 10
15,181,590	Stk.	Feb 13	4/1c/8†	Gaslight and Coke 4 p.c. Ord.	69–101	+½	4 9 9
2,600,000	,,	,,	3½	Do. 3½ p.c. max.	87–90	..	3 17 9
3,799,735	,,	,,	4	Do. 4 p.c. Con. Pref.	106–109	..	3 13 5
4,193,975	,,	June 12	3	Do. 3 p.c. Con. Deb.	83–85	..	3 10 7
258,740	Stk.	Mch. 12	5	Hastings & St. L. 3½ p.c.	93–95	..	5 2 0
82,500	,,	,,	6½	Do. do. 5 p.c.	112–115	..	5 13 1
70,000	10	Apl 29	11	Hongkong & China, Ltd.	18–19	..	5 15 9
4,940,000	Stk.	May 14	8	Imperial Continental	180–182	+½	4 7 11
473,600	Stk.	Feb. 13	3½	Do. 3½ p.c. Deb. Red.	95–97	..	3 12 2
195,242	Stk	Mch. 12	6	Lea Bridge Ord. 5 p.c.	113–118	..	5 1 8

Issue	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
561,000	Stk.	Feb. 27	10	Liverpool United A	232–234	..	4 5 6
718,100	,,	,,	7	Do. B	166–168	+1	4 3 4
306,083	,,	June 26	4	Do. Deb. Stk.	104–106	..	3 15 6
75,000	5	June 26	6	Malta & Medn., Ltd.	4¼–4⅜	..	6 6 4
560,000	100	Apl. 1	5	Met. of 5 p.c. Deb.	101–103	..	4 17 1
250,000	100	,,	4½	Melbourne 4½ p.c. Deb.	101–103	..	4 7 5
541,920	20	May 29	3½	Monte Video, Ltd.	11–12	..	5 16 8
1,775,892	Stk.	July 30	4/12/6	Newc'tle & G'tesh'd Con.	107½–108½*	+1½	4 5 3
418,463	Stk.	June 26	3½	Do. 3½ p.c. Deb.	90–92	..	3 16 1
15,000	10	Feb. 27	10	North Middlesex 10 p.c.	20–21	..	4 15 3
55,940	10	,,	7	Do. 7 p.c.	13½–14½	..	4 16 7
300,000	Stk.	Apl. 29	8	Oriental, Ltd.	140–143	..	5 11 11
60,000	5	Mch. 27	7	Ottoman, Ltd.	6–6⅛	..	5 7 8
398,490	5	Apl. 29	7	Primitiva Ord.	6–6⅛	..	5 7 8
796,980	5	July 30	5	Do. 5 p.c. Pref.	4⅞–5⅛*	..	4 17 7
488,900	100	June 1	4	Do. 4 p.c. Deb.	93–95	..	4 4 3
1,000,000	10	Apl. 29	8	River Plate Ord.	13¼–13¾	..	5 16 5
312,650	Stk.	June 26	4	Do. 4 p.c. Deb.	92–94	+1	4 5 1
250,000	10	Apl. 10	8	San Paulo, Ltd.	13½–14	..	5 14 4
125,000	50	July 1	5	Do. 5 p.c. Deb.	49–51	..	4 18 0
135,000	Stk.	Mch. 12	10	Sheffield A	245–246	..	4 1 4
209,984	,,	,,	10	Do. B	244–246	..	4 1 4
523,500	,,	,,	10	Do. C	244–246	..	4 1 4
70,000	10	May 29	10	South African	13–14	..	7 2 10
6,429,895	Stk.	Feb. 13	1/6/8	South Met., 4 p.c. Ord.	119–122	+½	4 7 4
1,895,445	,,	July 15	3	Do. 3 p.c. Deb.	83–85	..	3 10 7
209 820	Stk	Mch. 12	8	South Shields Con. Stk.	155–157	..	5 1 11
605,200	Stk.	Feb. 27	5/6/8	S'th Suburb'n Ord. 5 p.c.	116–119	..	4 9 7
60,000	,,	,,	5	Do. 5 p.c. Pref.	120–125	..	4 0 0
117,058	,,	July 15	5	Do. 5 p.c. Deb. Stk.	120–123	..	4 0 0
502,310	Stk.	May 14	5	Southampton Ord.	108–113	+3	4 8 6
120,000	Stk.	Feb. 27	6½	Tottenham A 5 p.c. and B 3½ p.c.	120–125	..	5 8 0
398,940	,,	,,	5½		107–109	..	4 16 4
149,470	,,	June 26	4	Edmonton 4 p.c. Deb.	98–103	..	3 17 8
182,380	10	June 12	8	Tuscan, Ltd.	10–10½	..	7 12 4
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	99–101	..	4 19 0
193,742	Stk.	Feb. 27	5	Tynemouth 5 p.c. max.	106–107	..	4 13 6
255,636	Stk.	Feb. 13	6½	Wandsworth B 3½ p.c. and 3 p.c. Deb. Stk. Putney	128–133	..	4 17 9
80,075	,,	June 26	3		72–77	..	3 17 11
845,872	,,	Feb. 27	5⅛	West Ham 5 p.c. Ord.	101–104	+1½	4 18 6
185,000	,,	,,	5	Do. 5 p.c. Pref.	120–125	..	4 0 0
228,300	,,	June 26	4	Do. 4 p.c. Deb. Stk.	100–105	..	3 16 2

Prices marked * are "Ex div." † Next dividend will be at this rate.

A Handsome F'Cap Volume giving a complete account of the

GRANTON GAS-WORKS

Of the EDINBURGH AND LEITH CORPORATIONS' GAS COMMISSIONERS,

Their Design, Construction, and Equipment,

With ILLUSTRATIONS, PLATES, AND DETAILS OF COSTS,

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O'NEILL'S OXIDE
For GAS PURIFICATION.
LARGEST SALE OF ANY OXIDE.

SPENT OXIDE PURCHASED IN ANY DISTRICT.

GAS PURIFICATION & CHEMICAL CO., LD.,
PALMERSTON HOUSE,
OLD BROAD STREET, LONDON, E.C.

WINKELMANN'S
"VOLCANIC" FIRE CEMENT.
Resists 4500° Fahr. Best for GAS-WORKS.
ANDREW STEPHENSON, 182, Palmerston House, Old Broad Street, London, E.C. "Volcanism, London."

BROTHERTON & CO., LIMITED.
Offices: City Chambers, LEEDS.
Correspondence invited.

D. ANDERSON AND COMPANY,
GAS LIGHTING ENGINEERS AND CONTRACTORS,
73, FARRINGDON ROAD, LONDON, E.C.
Telegrams: "DACOLIGHT LONDON." Telephone: 2336 HOLBORN.

SULPHURIC ACID for Sale, specially suitable for making Sulphate of Ammonia.
BROTHERTON AND CO., LTD., Chemical Manufacturers, Works: BIRMINGHAM, LEEDS, WAKEFIELD, and SUNDERLAND.

TO Gas Managers, &c., Wanted, Old Condemned GAS-METERS, from 1-light to 1000-light, for destruction to re-claim Metals. Write for Prices, Stating Quantities and Sizes, and if Wets or Drys. Scrap Metals, Drosses, Metal Shop Sweepings, &c., also bought
J. WILSON, Pleasant Grove, York Road, King's Cross, LONDON, N.

SULPHURIC ACID.

SPECIALLY prepared for Sulphate of AMMONIA Makers by
CHANCE AND HUNT, LIMITED,
Works: OLDBURY, WEDNESBURY, AND STAFFORD.
Address Correspondence and Inquiries to OLDBURY, WORCS.
Telegrams: "CHEMICALS, OLDBURY."

AMMONIA.
Consumers in any form are invited to correspond with CHANCE AND HUNT, LTD., Chemical Manufacturers, OLDBURY, WORCS.

"VITERNUS" METALLIC PAINT FOR GAS-WORKS PLANT.
JOHN E. WILLIAMS AND CO.,
LOWER MOSS LANE,
MANCHESTER, S.W.
Telegrams: "ENAMEL." Nationa Telephone 1759.

DELLWIK-FLEISCHER WATER GAS.
BLUE WATER GAS, CARBURETTED WATER GAS, SELF-CARBURETTING.
FOR Particulars of Annual Generating Capacity of Plants built or in course of construction, see advertisement in the "JOURNAL" for July 28, p. 278.
The DELLWIK-FLEISCHER WATER GAS SYNDICATE, Belgravia Chambers, 25, Victoria Street, Westminster, LONDON, S.W. Telegraphic Address "Dellwik, London."

HYDRATED OXIDE OF IRON.
PREPARED from Pure Iron.
Twice as Rich as Bog Ore.
Gives no back Pressure.
The Cheapest in the Market.
READ HOLLIDAY AND SONS, LTD., HUDDERSFIELD.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 54 & 47, Westminster Bridge Road, LONDON, S.E.
WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS, AND GOVERNORS.
REPAIRS RECEIVE PROMPT ATTENTION.
Telephones: 815 Oldham, and 2412 Hop, London.
Telegrams:—
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AND
CARBURINE FOR GAS ENRICHING.
ALSO
THE MAXIM PATENT CARBURETTOR.
For Prices, &c., apply to
THE GAS LIGHTING IMPROVEMENT CO., LTD.,
7, BISHOPSGATE STREET WITHOUT,
LONDON, E.C.
Telegraphic Address: "Carburine, London."

R. & G. HISLOP
GAS ENGINEERS, RETORT BUILDERS, CONTRACTORS, &c.
RETORT SETTINGS, COAL-TESTING PLANT, BOILER FIRING.
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MEWBURN, ELLIS, & PRYOR, Chartered Patent Agents, 70 & 72, Chancery Lane, London, W.C. Telegrams: "Patent London." Telephone: No. 243 Holborn.

FIDDES-ALDRIDGE
SIMULTANEOUS Discharging-Charger.
The one Machine which Discharges and Charges at One Stroke.
See Advertisement, July 21, p. III. of Centre.
ALDRIDGE AND RANKEN,
9, VICTORIA STREET, WESTMINSTER, S.W.
Telegrams: "MOTORPATHY, LONDON." Telephone: 5118 WESTMINSTER.

AMMONIACAL Liquor wanted.
CHANCE AND HUNT, LTD., Chemical Manufacturers, OLDBURY, WORCS.
Telegrams: "CHEMICALS."

GAS TAR wanted.
BROTHERTON AND CO., LTD., Tar Distillers.
Works: BIRMINGHAM, GLASGOW, LEEDS, LIVERPOOL, WAKEFIELD, AND SUNDERLAND.

SULPHATE OF AMMONIA
SATURATORS and all LEAD and TIMBER WORK in Connection with Sulphate Plants.
We guarantee promptness, with efficiency for Repairs.
JOSEPH TAYLOR AND CO., CENTRAL PLUMBING WORKS, BOLTON.
Telegrams: SATURATORS, BOLTON. Telephone 0848.

THE KEITH LIGHT.
5000 INSTALLATIONS NOW IN USE.
SEE illustrated advertisement in next week's issue.
JAMES KEITH AND BLACKMAN CO., LTD., 27, Farringdon Avenue, LONDON, E.C.

AMMONIACAL Liquor wanted.
BROTHERTON AND CO., LTD., Ammonia Distillers.
Works: BIRMINGHAM, GLASGOW, LEEDS, LIVERPOOL, WAKEFIELD, AND SUNDERLAND.

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(NATURAL.)
SPENT OXIDE PURCHASED.
BALE'S FIRE CEMENT.
PAINT FOR GAS-WORKS.
BALE & CHURCH,
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SULPHURIC ACID.

SPECIALLY prepared for the Manu- facture of SULPHATE OF AMMONIA.
SPENCER CHAPMAN & MESSEL, LTD.,
with which is amalgamated WM. PEARCE & SONS, LTD.
36, Mark Lane, LONDON, E.C. Works: SILVERTOWN.
Telegrams: "HYDROCHLORIC, LONDON."
Telephone: 341 AVENUE.

BY adopting Cripps's Bye-Pass Valves inside your Purifiers, you can relieve the Back-Pressure in the Lower Tiers when the Purifying Material gets hard. They are extremely useful and economical.
Sole Makers: C. & W. WALKER, LIMITED, Midland Iron-Works, Donnington, near Newport, SHROPSHIRE.

LUX'S GAS PURIFYING MASS.
See Advertisement on p. 414.
FRIEDRICH LUX, LUDWIGSHAFEN-AM-RHEIN.

GAZINE—A radical Solvent and Pre- ventative of Naphthalene deposits, and the Automatic cleaning of Mains and Services.
It is also used for the Enrichment of Gas, and has an illuminating value double that of 90 per cent. Benzol.
Supplied by C. BOURNE, West Moor Chemical Works, KILLINGWORTH, or through his Agent, F. J. NICOL, Pilgrim House, NEWCASTLE-ON-TYNE.
Telegrams: "DORIC," Newcastle-on-Tyne. National Telephone No. 2497.

BRISTOL RECORDING GAUGES AND THERMOMETERS.
J. W. & C. J. PHILLIPS, 23, COLLEGE HILL, LONDON, E.C., and 7, PARK SQUARE, LEEDS.

GAS PLANT for Sale—We can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters, Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also a few COMPLETE WORKS. Compare Prices and Particulars before ordering elsewhere.
FIRTH BLAKELEY, SONS, AND COMPANY, LIMITED, Thornhill, DEWSBURY.

PINCHBECK'S Meters and Burglar PROOF STRONG BOX.
See illustrated advertisement, July 21, p. I. of Centre.
PINCHBECK LIMITED, Adams Place, George's Road, HOLLOWAY, N.

THE British Bulk Creosote Company, Borough Road, Weaste, MANCHESTER.

J. E. C. LORD, Ship Canal Tar Works, Weaste, Manchester. Pitch, Creosote, Benzols, Toluol, Naphtha, Pyridine, all kinds of Cresylic Acid, Carbolic Acid, Sulphate of Ammonia, &c.

TEACHING BY CORRESPONDENCE.
MR. HERBERT LEES is open to pre- pare Students, by Correspondence, for the "Gas Engineering" and "Gas Supply" Examinations of the City and Guilds of London Institute.
For Terms, &c., Apply to Elvaston Road, HEXHAM.

THE RECORD OF THE SEASON.
THREE Medals were obtained by our Students at the recent City and Guilds Examinations in Gas Engineering and Gas Supply. New Classes starting at once.
CORRESPONDENCE COLLEGE COMPANY, 26, Green Street, CAMBRIDGE.

ROBERT DEMPSTER & SONS, Ltd.,
Contractors for Complete CARBONIZING PLANTS and every description of GAS APPARATUS and ELEVATING and CONVEYING PLANT, Rose Mount Iron-Works, Elland.

SULPHATE OF AMMONIA AND TAR.

WANTED, Purchasing or Commission AGENTS. Principals only.
Address, with full Particulars, No. 4971, care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

PUPIL—Wanted to place Youth just leaving Public School with Manager of good Gas-Works or good Firm of Gas Engineers.
Address No. 4977, care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

CITY AND COUNTY OF KINGSTON-UPON-HULL.

APPOINTMENT OF WATER ENGINEER.

THE Corporation are prepared to receive APPLICATIONS for the Appointment of ENGINEER-IN-CHIEF to their Water-Works.
Preference will be given to an Engineer having a knowledge of Gas Manufacture.
The person appointed will be required to devote the whole of his time to the Service of the Corporation and not to engage, either directly or indirectly, in any other Profession or Business.
The Salary will be £500 per Annum.
The Water Supply of the City is obtained from Wells, Adits, and Bores; and an Engineer having Experience of large Pumping Engines will be preferred.
Applications, stating Age, Experience, and Qualifications, with *copies* or *prints* of not more than Three Testimonials, and marked "Water Engineer," should be sent to the undersigned before Ten a.m., on Friday, the 28th inst.
Canvassing will disqualify.

E. Laverack,
Town Clerk.

Town Hall, Hull,
Aug. 7, 1908.

WANTED, a Small Second-Hand WATER-GAS PLANT Complete, Capable of making up to 100,000 Cubic Feet of Gas per Twenty-Four Hours.
Give full Particulars of the Plant, Dimensions, &c. All the burnt brickwork to be cleaned out. State where it can be seen, and cost, packed and marked for shipment f.o.b. Liverpool.
Offers to be sent to "L69," care of Lee and Nightingale's Advertising Offices, Liverpool.

FOR SALE—Complete lot of Retort- BENCH MOUNTINGS, HYDRAULIC MAIN, ASCENSION PIPES, Thirteen Self-Sealing RETORT MOUTHPIECES, &c., &c. Capital Condition.
Particulars from J. D. Keillor, Manager, Gas-Works, Lochgelly.

WE have the following New and Over- hauled Second-Hand PLANT FOR SALE:—

Gasholders,	30 ft. by 12 ft.	New Steel Tank.
"	35 ft. by 10 ft.	Cast-Iron Tank.
"	*45 ft. by 12 ft.	
"	*50 ft. by 16 ft.	
"	*50 ft. by 15 ft. 4 in.	(Two-Lift)

*We can re-erect these in Brick or New Steel Tanks.
8-inch, 9-inch and 10-inch Condensers.
New "Cripps" Washer (8-inch), 150,000, c.f. per day.
Walker's Purifying Machine.
Exhausters and Engines, Single and Combined, 2000 to 60,000 feet per hour.
Cast-Iron Tower Scrubber, 7 ft. diameter, 55 ft. high.
Purifiers, sets 6-fts., 10-fts., 12-fts., and 20-fts.
Plans and Quotations of new Sets.
6-inch to 18-inch Station Meters, Governors, &c.
Tar and Liquor Pumps.
Producer-Gas Plants for 150 to 300 H.P.
Boilers, Tanks, and all requisites for Gas-Works.
Firth Blakeley, Sons, and Company, Limited, Gas Engineers, Thornhill, Dewsbury (Yorks.).

THE Cleator Moor Urban District Council are prepared to receive TENDERS for the Supply of 1800 Tons of Best GAS COAL during a period of Twelve Months commencing Sept. 1, 1908.
The Coal to be delivered carriage paid at the Gas-Works Siding, Cleator Moor; and it must be Well Screened and free from objectionable matter.
Tenders to be sent in on or before Friday, Aug. 21.
Form of Tender and other Information required can be had on Application to the undersigned.

Henry Rothery,
Clerk to the Council.

Public Offices, Cleator Moor,
Aug. 5, 1908.

URBAN DISTRICT COUNCIL OF LEIGH-ON-SEA.

TENDERS FOR SURPLUS COKE.

THE Gas Committee of the above Council are desirous of Disposing of a Considerable Quantity of Surplus COKE in consequence of certain Extensions which they are carrying out, and are prepared to receive TENDERS for that purpose.
Tenders, endorsed "Tender for Coke," must be for quantities of not less than 20 chaldrons, to be cleared in 14 days for Cash, and sent to me the undersigned so as to reach me by Eleven o'clock a.m., on Wednesday, the 12th day of August, 1908.
The Committee do not bind themselves to accept any Tender.

By order,
W. Carlyle Croasdell,
Clerk to the Council.

Council Offices, Leigh-on-Sea,
August, 1908.

HINCKLEY URBAN DISTRICT COUNCIL WATER-WORKS.

TO MAKERS OF CAST-IRON TANKS.

Contract No. 1.

THE Urban District Council for the Urban District of Hinckley are prepared to receive TENDERS for the Enlargement of the High-Level CAST-IRON TANK on the Tower at their Water-Works at Hinckley.
The Plans may be inspected and Specification and Form of Tender may be had on payment of the sum of Two Guineas (to be returned on receipt of a *bonâ-fide* Tender) on Application at the Office of the Surveyor at the Council Offices, Hinckley, or at the Office of Messrs. T. & C. Hawksley, 30, Great George Street, Westminster, S.W., on or after Monday, the 10th day of August, 1908, and Tenders must be delivered at my Office at the Council Offices, Hinckley, at or before Noon on Wednesday, the 26th day of August, 1908.
The Council do not bind themselves to accept the lowest or any Tender.

A. S. Atkins,
Clerk.

Council Offices,
Hinckley, Aug. 1, 1908.

HINCKLEY URBAN DISTRICT COUNCIL WATER-WORKS.

TO WELL SINKERS.

Contract No. 2.

THE Urban District Council for the Urban District of Hinckley are prepared to receive TENDERS for the Construction of a PILOT SHAFT and HEADINGS or DRIFTS at Snarestone, adjacent to their Snarestone Pumping-Station.
The Plans may be inspected and Specification and Form of Tender may be had on payment of the sum of Two Guineas (to be returned on receipt of a *bonâ-fide* Tender) on Application at the Office of the Surveyor, at the Council Offices, Hinckley, or at the Office of Messrs. T. & C. Hawksley, 30, Great George Street, Westminster, S.W., on and after Monday, the 10th day of August, 1908; and Tenders must be delivered at my Office at the Council Offices, Hinckley, at or before Noon on Wednesday, the 26th day of August, 1908.
The Council do not bind themselves to accept the lowest or any Tender.

A. S. Atkins,
Clerk.

Council Offices,
Hinckley, Aug. 1, 1908.

URBAN DISTRICT COUNCIL OF LYMM.

THE above Council are prepared to receive TENDERS for the Supply of CANNEL and Best Screened GAS COAL, to be delivered at their Gas-Works in Lymm, for a term of Twelve Months from the 1st day of September, 1908.
The probable quantities required will be about 200 Tons of Cannel and about 2000 Tons of Gas Coal, which must be Freshly Wrought, well Screened, and free from Sulphurous Pyrites and other objectionable matter; but the Council reserve the right of increasing or decreasing the quantities named.
The person whose Tender is accepted will be required to enter into an agreement with the Council for the due performance of his Contract.
Sealed Tenders, stating Price per Ton delivered by Boat alongside the Works, to be sent to the undersigned on or before the 19th day of August, 1908, and endorsed "Coal Tender."
The Council do not bind themselves to accept the lowest or any Tender.
Forms of Tender are not Supplied.
Further Particulars may be had on Application to the Gas Manager, Mr. W. L. Donaldson.

W. Mullard,
Clerk.

Council Offices, Lymm,
Cheshire, July 31, 1908.

TAR AND AMMONIACAL LIQUOR.

THE Lymm Urban District Council are prepared to receive TENDERS for the Purchase of the Surplus TAR and AMMONIACAL LIQUOR made at their Gas-Works, for a term of One Year from the 1st day of September, 1908 (or for such longer term as may be contracted for with the consent of the Council).
Tar and Liquor will be delivered free into Contractor's boat on the Bridgwater Canal.
Tenders to be sent to the undersigned on or before the 19th day of August, 1908, endorsed "Tar."
The purchaser will be required to enter into an Agreement with the Council for the due performance of his Contract.
The Council do not bind themselves to accept the highest or any Tender.
Forms of Tender are not Supplied.
Further Particulars may be had on Application to the Gas Manager, Mr. W. L. Donaldson.

W. Mullard,
Clerk.

Council Offices, Lymm,
Cheshire, July 31, 1908.

ISLE OF THANET GASLIGHT AND COKE COMPANY.

THE Directors of the above Company are prepared to receive TENDERS for the Supply and Delivery to their Gas-Works at Margate of 100 6-inch CAST-IRON GAS-PIPES.
Further Particulars and Form of Tender may be obtained from the undersigned.
The Directors do not bind themselves to accept the lowest or any Tender.
Tenders, endorsed "Gas-Mains," to be addressed to the Chairman, and received at these Offices on or before Thursday, Aug. 13, next.

By order,
Frank A. Winstanley,
Engineer and Manager.

Offices: The Dane,
Margate, Aug. 1, 1908.

CITY OF BRADFORD.

TO COLLIERY PROPRIETORS AND OTHERS.

THE Gas Committee of the Bradford Corporation are prepared to receive TENDERS for the Supply of Best GAS COAL COBBLES, NUTS, and CANNEL, all to be Well Screened, Dressed, and free from Shale and Pyrites, to be delivered at the several works of the Corporation during the period of One Year, commencing on the 1st day of October next.
Form of Tender, with any further Information required, may be had on Application to Mr. Chas. Wood, Gas Engineer, Town Hall.
Sealed Tenders, endorsed "Tender for Coal," to be sent to me on or before Thursday, the 27th of August next.
The Contracts will be let subject to the Fair Contracts Clauses of the Corporation, which may be seen at the Town Clerk's Office, and which the accepted Contractors will be required to sign.
The lowest or any Tender will not necessarily be accepted.

Frederick Stevens,
Town Clerk.

Town Hall, Bradford,
July 31, 1908.

CORPORATION OF HAVERFORDWEST.

COAL.

TENDERS are invited for the Supply of about 1800 Tons of Double Screened GAS COAL of the Very Best Quality, to be delivered at the Haverfordwest Railway Station or at the Gas-Works Quay, Haverfordwest, by water communication, in quantities as required by the Gas Manager during the Year commencing on Sept. 1, for the Corporation of Haverfordwest.
Tenders by Aug. 18.
Forms of Tender and further Particulars of

Mr. R. T. P. Williams,
Town Clerk.

Haverfordwest,
July 30, 1908.

TENDERS FOR GAS COAL.

THE Gas Committee of the Carnarvon Corporation invite TENDERS for the Supply of 2500 Tons of Best Screened GAS COAL and 200 Tons of Screened CANNEL, to be delivered free as required in Trucks on the Gas-Works Siding, Carnarvon, during the Twelve Months ending the 31st of August, 1909.
Sealed Tenders, endorsed "Tender for Coal," and addressed to the Chairman of the Gas Committee, Guildhall, Carnarvon, to be delivered on or before Thursday, the 20th inst.
The Committee reserve to themselves the right to divide the quantity into two or more Contracts, and do not bind themselves to accept the lowest or any Tender.
Forms of Tender and Specification to be had on Application to the undersigned.

William M. Ruxton,
Manager.

Gas Offices, Carnarvon,
Aug. 3, 1908.

COUNTY BOROUGH OF BURNLEY.

THE Gas Committee of the Burnley Corporation are prepared to receive TENDERS for the Supply and Erection of a STEEL ROOF for the new Retort-House at the Gas-Works.
Specifications and Forms of Tender may be obtained on Application to the Engineer, Mr. J. P. Leather, Gas-Works, Burnley.
The Drawings may be inspected at the Gas-Works, or, if desired, photo. copies will be sent to intending Contractors on receipt of 10s.
Tenders, endorsed "Steel Roof," must be sent in not later than Wednesday, the 26th of August, 1908, addressed to the Chairman of the Gas Committee, Town Clerk's Office, Town Hall, Burnley.

Peregrine Thomas,
Town Clerk.

Town Hall, Burnley,
Aug. 3, 1908.

BOROUGH OF DARWEN.

TENDERS FOR GAS SLACK.

THE Gas Committee of the above Cor- poration are prepared to receive TENDERS for the Supply of GAS SLACK for One Year to be delivered at the Gas-Works Siding in the Corporation Waggons.
Forms of Tender and all Information as to Quantities may be obtained on Application to Mr. A. H. Smith, Gas Engineer, Darwen.
Sealed Tenders, endorsed "Gas Slack," must be delivered to the undersigned not later than the 29th day of August, 1908.
No Tender necessarily accepted.

By order,
William P. Halliwell,
Town Clerk.

Town Clerk's Office,
Darwen, Aug. 4, 1908.

STRATFORD-UPON-AVON CORPORATION.
(Gas Department.)

THE Gas Committee invite Tenders for the Supply of 5000 Tons of Good Screened GAS COAL or NUTS, for delivery during the Twelve Months ending Sept. 30, 1909.
Forms of Tender and other Particulars can be obtained upon Application to the Engineer and Manager.
Tenders to be sent in (and will be accepted only on the Forms supplied) not later than Aug. 22, 1908.
The lowest or any Tender not necessarily accepted.

J. S. Cranmer,
Engineer and Manager.

August, 1908.

THE Proprietor of Letters Patent No. 15,551 of 1903, relating to "GAS BURNERS," desires to DISPOSE of the Patent or to Grant LICENSES to Interested Parties on Reasonable Terms.
Inquiries to be addressed to Cruikshank and Fairweather, Limited, 65-66, Chancery Lane, London, W.C.